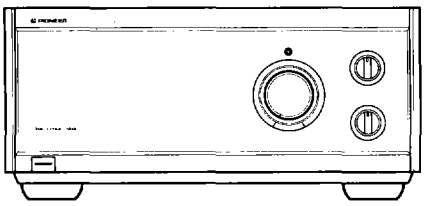
PIONEER®
The Art of Entertainment

Service Manual



ORDER NO.
ARP2858

STEREO AMPLIFIER
A-09

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model	Power Requirement	Remarks
	A-09		
MEZ	○	AC220−230V	−

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1. EXPLODED VIEWS, PACKING AND PARTS LIST

NOTES:

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

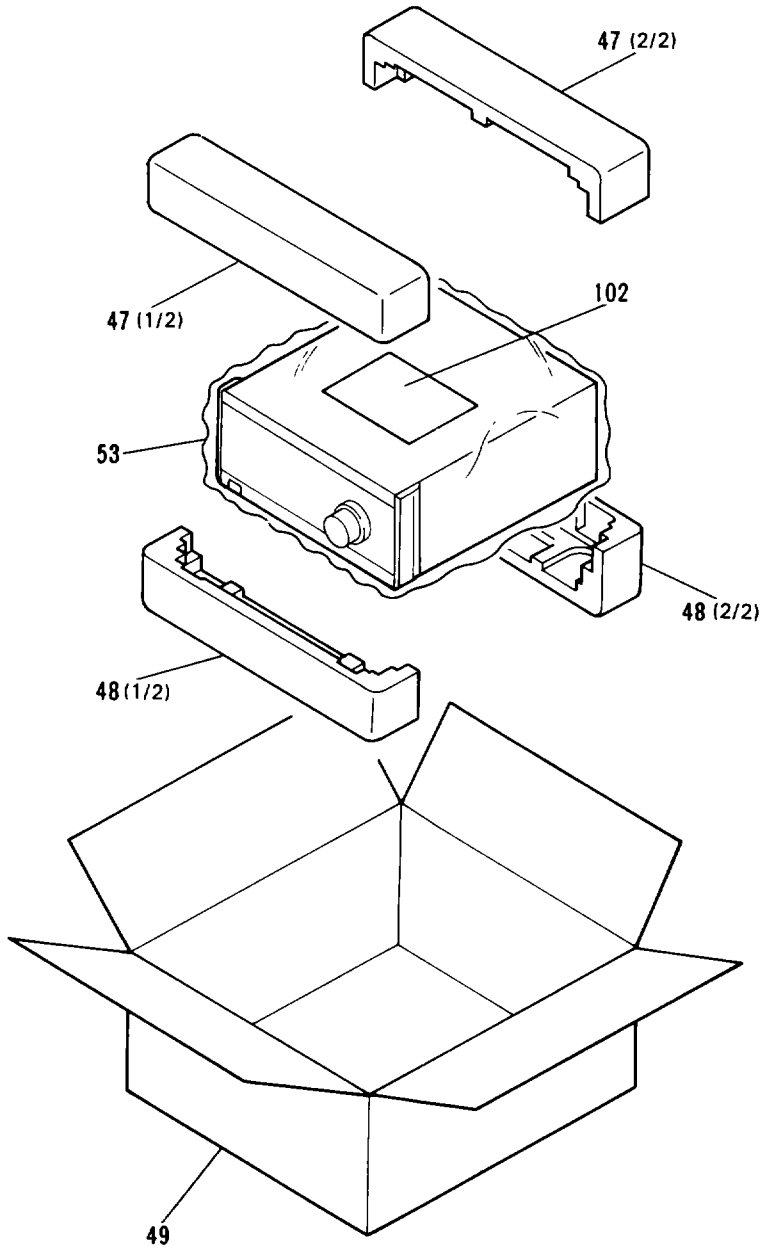
1.1 PARTS LIST

Mark	No.	Description	Parts No.
	1	ROTARY KNOB L	AAB1285
	2	ROTARY KNOB S	AAB1286
	3	POWER KNOB ASSY	AAD2281
	4	ESCUTCHEON	AAH1059
	5	INDICATOR LENS	AAK2303
	6	ESCUTCHEON	AAK2304
	7	SASH SPACER	AAK2305
	8	BONNET ESCUTCHEON	AAK2306
	9	ESCUTCHEON S	AAK2317
	10	AL PANEL	AAP1250
	11	INPUT ASSY	AWZ4861
	12	VOLTAGE AMP ASSY	AWZ4862
	13	WASHER	WS40PKI
	14	BINDER	AEP−215
	15	SCREW	ABA−298
	16	SCREW (STEEL)	ABA1006
	17	SCREW (STEEL)	ABA1011
	18	SCREW (STEEL)	ABA1050
	19	SCREW	ABA1056
	20	SCREW	ABA1022
	21	SCREW	ABA1156
	22	WASHER (COPPER)	ABE1001
	23	BUSH	ABF1015
	24	COIL SPRING A	ABH1056
NSP	25	SPACER RING	AEB1080
NSP	26	RUBBER RING	AEB1185
NSP	27	AC CORD HOLDER	AEB1200
NSP	28	DAMPER A	AEB1204
NSP	29	DAMPER B	AEB1205
NSP	30	DAMPER C	AEB1206
NSP	31	VR DAMPER RUBBER	AEB1207
NSP	32	RUBBER	AEB1210
NSP	33	RUBBER	AEB1211
NSP	34	RUBBER STOPPER	AEB1215
NSP	35	MOUNTING PLATE	AKF1021
NSP	36	COVER	AEC−294
	37	BINDER	AEC−826
	38	NYLON RIVET	AEC1160
	39	HOLDER	AEP−098
NSP	40	AC CORD CATCHER	AEC1397
NSP	41	SHIELD PLATE ASSY	AEC1401
NSP	42	PVC PANEL	AEC1409
NSP	43	SHIELD PLATE ASSY	AEC1432
NSP	44	SHIELD PLATE ASSY	AEC1458
NSP	45	SHIELD PLATE ASSY	AEC1434
◉	52	POWER R I/O ASSY	AWZ4250
◉		(POWER L I/O ASSY)	AWZ4249
NSP	53	VINYL POUCH	AHG1163
⚠	54	TERMINAL 2−P	AKC−071
NSP	55	GROUND TERMINAL	AKE−046
	56	SPEAKER TERMINAL 1−P	AKE1046
	57	SPEAKER TERMINAL 1−P	AKE1047
	58	FUSE HOLDER	AKR1005
NSP	59	DUST COVER	AKT1046
NSP	60	CHASSIS BASE	AMA1010
	61	HOLDER	AMR1178
NSP	62	POWER SWITCH HOLDER	AMR2405
NSP	63	FOOT	AMR2468
NSP	64	VOLUME STOPPER	AMR2458
NSP	65	SIDE PANEL R	ANA1203
NSP	66	SIDE PANEL L	ANA1204
	67	FRONT PANEL A	ANB1516
	68	FRONT PANEL B	ANB1537
NSP	69	REAR PANEL L (MTL)	ANC2236
NSP	70	REAR PANEL R (MTL)	ANC2237
	71	TOP PLATE A	ANE1358
	72	TOP PLATE B	ANE1359
NSP	73	BOTTOM PLATE	ANF1089
NSP	74	PCB HOLDER	ANG1745
NSP	75	EARTH PLATE	ANG1664
NSP	76	CHASSIS HOLDER	ANG1665
NSP	77	PCB HOLDER C	ANG1667
NSP	78	PCB HOLDER G	ANG1668
NSP	79	SIDE SASH HOLDER	ANG1737
NSP	80	AC CORD COVER	ANG1672
NSP	81	CHEMICON METAL BAR	ANG1673
NSP	82	PCB HOLDER H(MTL)	ANG1675
NSP	83	EARTH PLATE B	ANG1696
NSP	84	CHEMICON BAND ASSY L	ANG1721
NSP	85	CHEMICON BAND M	ANG1722
NSP	86	CHEMICON PLATE	ANG1723
	87	TRANSISTOR COVER L	ANG1724
	88	TRANSISTOR COVER M	ANG1725
◉	89	PROTECTION ASSY	AWZ4251

Mark	No.	Description	Parts No.
NSP	90	HEAT SINK R	ANH1382
NSP		(HEAT SINK L)	ANH1380
NSP	91	HEAT SINK(MTL)	ANH1385
NSP	92	REAR BOX A(MTL)	ANK1486
NSP	93	REAR BOX B	ANK1206
NSP	94	REAR BOX C	ANK1207
NSP	95	REAR BOX D	ANK1208
NSP	96	REAR BOX E	ANK1209
NSP	97	SHAFT ASSY	ANL1054
NSP	98	LONG SHAFT ASSY	ANL1051
	99	SCREW	BMZ30P140FCC
	100	SCREW	IPZ30P080FCC
	101	SCREW	IPZ30P120FCU
	102	INSTRUCTION MANUAL (English/French/German/Italian/ Swedish/Dutch/Spanish/ Portguese)	ARE1321
◉	103	FUNCTON ASSY	AWZ4252
◉	104	DIODE 2 ASSY	AWZ4253
◉	105	LED ASSY	AWZ4274
◉	106	POWER R NPN ASSY	AWZ4530
◉		(POWER L NPN ASSY)	AWZ4528
	107	SCREW	BMT30P080FCU
	108	SCREW	BMZ30P080FCU
	109	SCREW	BPZ30P120FZK
	110	NUT	NK90FCU
	111	NAME PLATE	PAN1262
	112	SCREW	PMZ40P060CAD
	113	SCREW	BBZ40P120FCU
	114	SCREW (STEEL)	ABA1009
	115	C1 ELECTR.CAPACITOR (33000μF/50V)	ACH1221
	116	C2 ELECTR.CAPACITOR (33000μF/50V)	ACH1221
	117	C3 ELECTROLYTIC CAPACITOR (12000μF/56V)	ACH1222
	118	C4 ELECTROLYTIC CAPACITOR (12000μF/56V)	ACH1223
⚠	119	C5 CAPACITOR (0.01/AC400V)	ACG1003
⚠	120	C6 CAPACITOR (0.01/AC400V)	ACG1003
⚠	121	AC POWER CORD	ADG1093
⚠	122	FUSE I=T2.5A,V=250	AEK−512
◉	123	POWER R PNP ASSY	AWZ4531
◉		(POWER L PNP ASSY)	AWZ4529
◉	124	REC SEL. SW ASSY	AWZ4532
⚠	125	Q4(Q3) TRANSISTOR	2SA1265N
⚠	126	Q8(Q7) TRANSISTOR	2SA1265N
⚠	127	Q12(Q11) TRANSISTOR	2SA1265N
⚠	128	Q16(Q15) TRANSISTOR	2SA1265N
⚠	129	Q2(Q1) TRANSISTOR	2SC3182N
⚠	130	Q6(Q5) TRANSISTOR	2SC3182N
⚠	131	Q10(Q9) TRANSISTOR	2SC3182N
⚠	132	Q14(Q13) TRANSISTOR	2SC3182N
⚠	133	Q24(Q23) TRANSISTOR	2SC4793
⚠	134	Q28(Q27) TRANSISTOR	2SC4793
⚠	135	Q32(Q31) TRANSISTOR	2SC4793
⚠	136	Q20(Q19) TRANSISTOR	2SA1837
⚠	137	Q22(Q21) TRANSISTOR	2SA1837
⚠	138	Q26(Q25) TRANSISTOR	2SA1837
⚠	139	Q30(Q29) TRANSISTOR	2SA1837
⚠	140	Q18(Q17) TRANSISTOR	2SC4793
⚠	141	S1 PUSH SWITCH	ASG−553
⚠	142	T1 POWER TRANSFORMER	ATS1487
	143	VARIABLE RESISTOR	ACW−133
NSP	144	SHIELD PLATE ASSY	AEC1437
NSP	145	SHIELD PLATE ASSY	AEC1436
	146	SCREW (STEEL)	ABA1047
	147	SCREW	ABA1114
	148	SCREW	ABZ35P080FCU
	149	SCREW	ABZ35P250FCU
	150	SCREW	AMZ30P050FCU
	151	SCREW	IBZ30P250FCU
	152	SCREW	PMZ30P050CAD
	153	SCREW	PMB40P160FCU
	154	SCREW	PMB40P300FCU
	155	WASHER	WB40FCU
	156	NUT	ABN−073
	157	NUT	NB40FCU
	158	NUT	NK70FCU
NSP	159	DAMP PLATE A	ANK1214
NSP	160	DAMP PLATE B	ANK1215
NSP	161	DAMP PLATE C	ANK1216
NSP	162	TAPE	AEH1020
NSP	163	TAPE	AEH1021
NSP	164	TAPE	AEH1022
	165	RUBBER SHEET	AEB1012
NSP	166	SPACER	AEB1216
NSP	167	RUBBER	AEB1222
	168	WASHER	ABF1016
	169	WASHER	ABF1027
	170	WASHER	ABE−053
NSP	171	PCB HOLDER	ANL1052
NSP	172	SHIELD PLATE ASSY	AEC1455
	173	SCREW	ABA1054
	174	SCREW	PMZ40P080FCU
	175	BINDER	AEC−093

Note : The descriptions in parentheses for No. 52, 90, 106, 123, and 125−140 are for the L side heat sink assy.

1.2 PACKING



1.3 EXPLODED VIEWS

Top view

Detail A

Front panel section

Front panel section (Rear view)

Bottom view

NOTE)
*1 : No. 109
*2 : No. 149
*3 : No. 151

L side heat sink assy

Chemical capacitor section

R side heat sink assy

Rear box section

Top view

NOTE: Screws adjacent to ▼ mark on product are used for disassembly.

Rear box section (Top view)

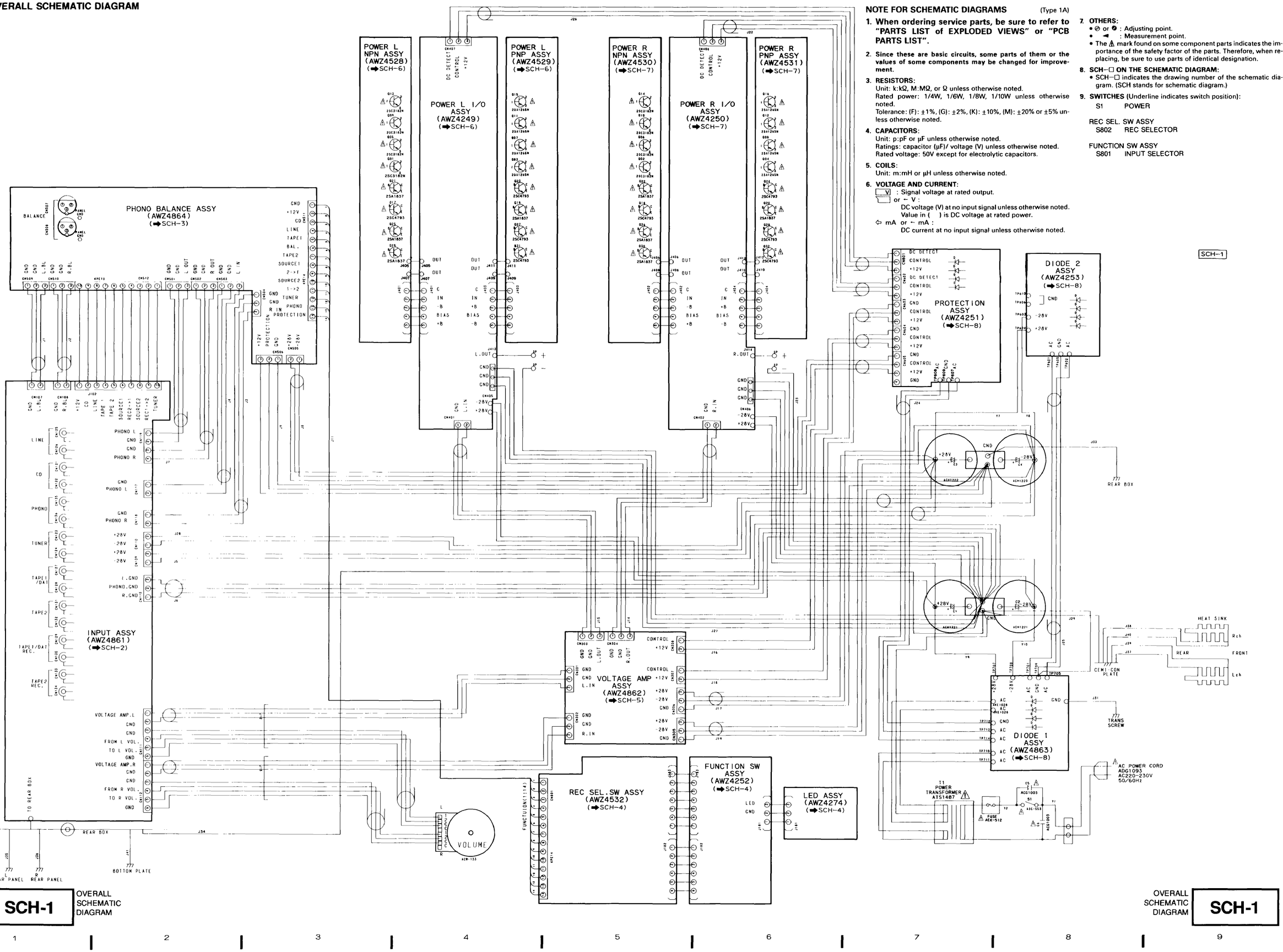
Chemical capacitor section (Top view)

R side heat sink assy (Top view)

(The L side heat sink assy is symmetrical with the R side heat sink assy.)

2. SCHEMATIC AND PCB CONNECTION DIAGRAMS

2.1 OVERALL SCHEMATIC DIAGRAM


POWER L NPN ASSY (AWZ4528) (➡SCH-6)
POWER L I/O ASSY (AWZ4249) (➡SCH-6)
POWER L PNP ASSY (AWZ4529) (➡SCH-6)
POWER R NPN ASSY (AWZ4530) (➡SCH-7)
POWER R I/O ASSY (AWZ4250) (➡SCH-7)
POWER R PNP ASSY (AWZ4531) (➡SCH-7)
PHONO BALANCE ASSY (AWZ4864) (➡SCH-3)
INPUT ASSY (AWZ4861) (➡SCH-2)
PROTECTION ASSY (AWZ4251) (➡SCH-8)
DIODE 2 ASSY (AWZ4253) (➡SCH-8)
DIODE 1 ASSY (AWZ4863) (➡SCH-8)
VOLTAGE AMP ASSY (AWZ4862) (➡SCH-5)
REC SEL.SW ASSY (AWZ4532) (➡SCH-4)
FUNCTION SW ASSY (AWZ4252) (➡SCH-4)
LED ASSY (AWZ4274) (➡SCH-4)
VOLUME
REAR BOX
L REAR PANEL
R REAR PANEL
BOTTOM PLATE
TRANS SCREW
CEMI-CON PLATE
HEAT SINK
AC POWER CORD ADG1093 AC220-230V 50/60Hz
T1 POWER TRANSFORMER ATS1487
FUSE AEK-512

NOTE FOR SCHEMATIC DIAGRAMS (Type 1A)

1. **When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".**
2. **Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.**
3. **RESISTORS:**
   Unit: k:kΩ, M:MΩ, or Ω unless otherwise noted.
   Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
   Tolerance: (F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% or ±5% unless otherwise noted.
4. **CAPACITORS:**
   Unit: p:pF or μF unless otherwise noted.
   Ratings: capacitor (μF)/ voltage (V) unless otherwise noted.
   Rated voltage: 50V except for electrolytic capacitors.
5. **COILS:**
   Unit: m:mH or μH unless otherwise noted.
6. **VOLTAGE AND CURRENT:**
   [V] : Signal voltage at rated output.
   ⏍ or ← V :
   DC voltage (V) at no input signal unless otherwise noted.
   Value in ( ) is DC voltage at rated power.
   ⇦ mA or ← mA :
   DC current at no input signal unless otherwise noted.
7. **OTHERS:**
   - ⊘ or ⊘ : Adjusting point.
   - ◄ : Measurement point.
   - The ⚠ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.
8. **SCH-□ ON THE SCHEMATIC DIAGRAM:**
   - SCH-□ indicates the drawing number of the schematic diagram. (SCH stands for schematic diagram.)
9. **SWITCHES** (Underline indicates switch position):
   S1 POWER

   REC SEL. SW ASSY
   S802 REC SELECTOR

   FUNCTION SW ASSY
   S801 INPUT SELECTOR

SCH-1

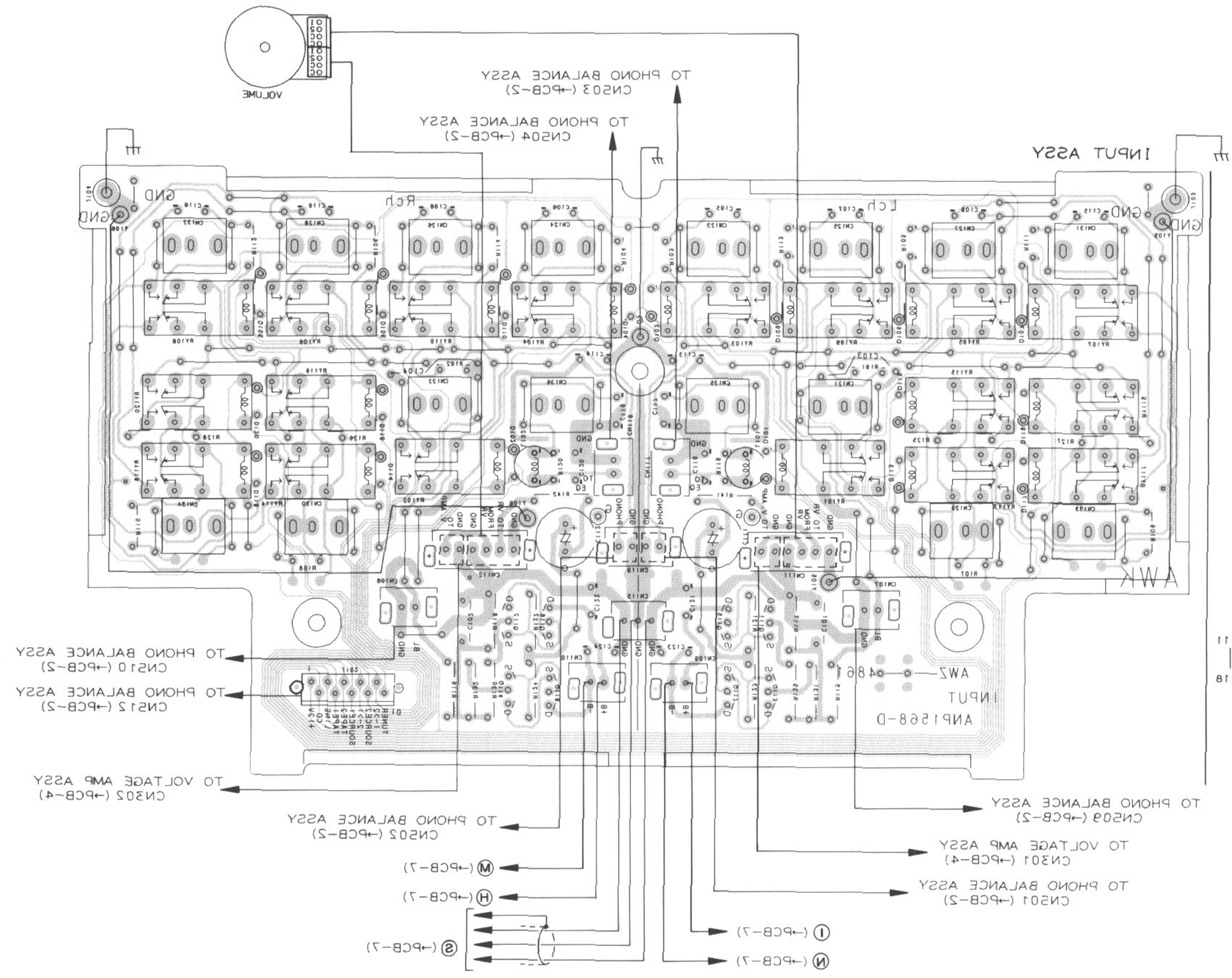
SCH-1 OVERALL SCHEMATIC DIAGRAM

OVERALL SCHEMATIC DIAGRAM **SCH-1**

2.2 INPUT ASSEMBLY

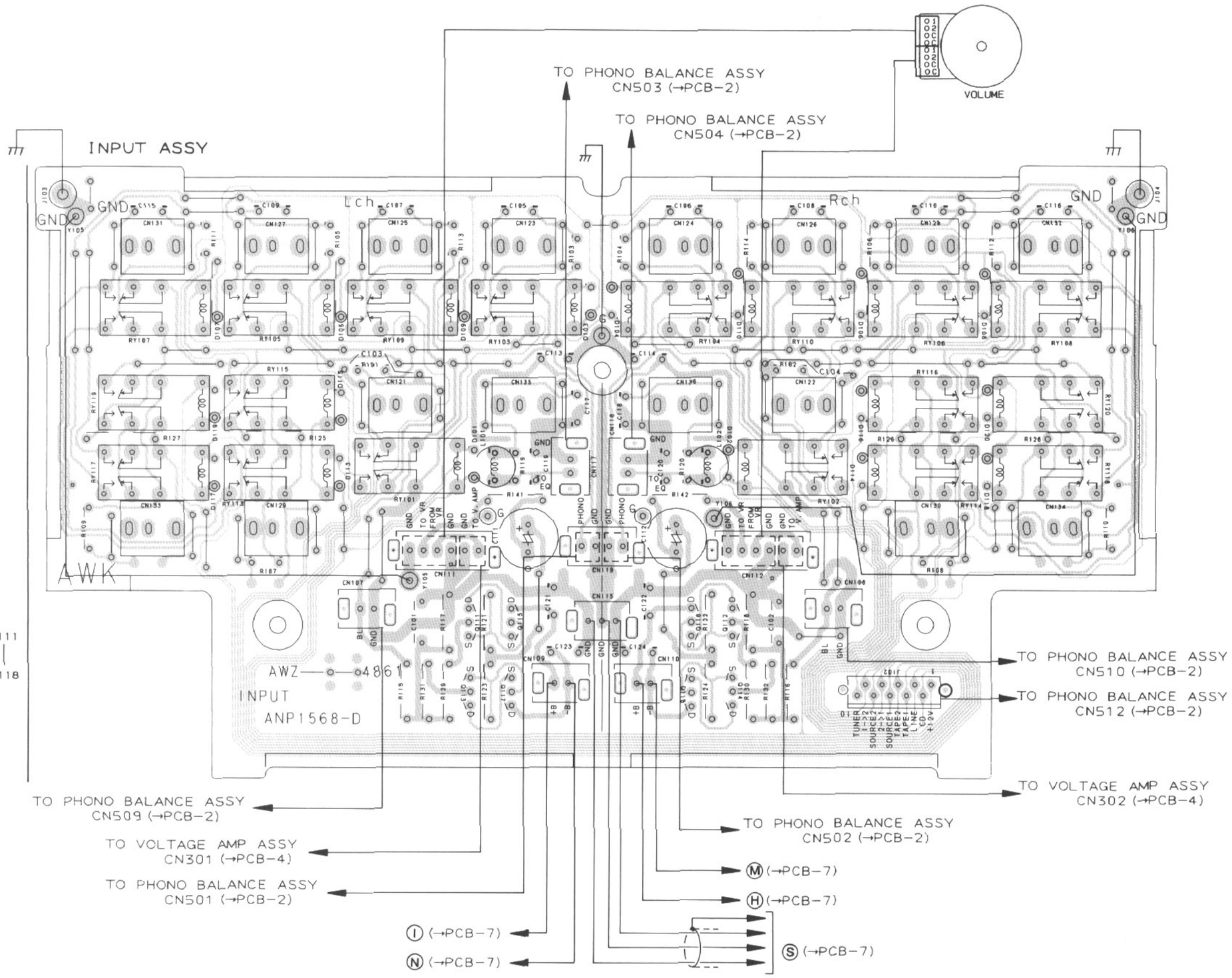
PCB-1

● This diagram is viewed from the foil side.



● This diagram is viewed from the mounted parts side.

PCB-1



NOTE FOR PCB DIAGRAMS:

1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
Q504 (E) Q504	Q504 Q504	Transistor
D203 D203	D203	Diode
C513 C513	C513	Capacitor (Polarized)

3. The transistor terminal marked with E or ⊏ shows the emitter.
4. The diode terminal marked with ⓐ or ⊂ shows cathode side.
5. The capacitor terminal marked with ⓒ or ⊏ shows negative terminal.

INPUT ASSY (AWZ4861)

➡:Signal route

SCH-2

CD

TUNER

LINE

TAPE1 /DAT

TAPE1 /DAT REC.

TAPE2

TAPE2 REC.

BUFFER AMP

+28V

-28V

0V

2SK183 Q115

2SK147 Q111

0.17V

-0.17V

2SJ72 Q113

2SJ44 Q117

2SJ44 Q114

2SJ77 Q112

2SK163 Q116

(→SCH-8)

GND
TO L VOL.
FROM L VOL.
GND
GND
VOLTAGE AMP.L

TO VOLTAGE AMP ASSY CN301 (→SCH-5)

L.GND
PHONO.GND
R.GND

Ⓢ (→SCH-8)

VOLTAGE AMP.R
GND
GND
FROM R VOL.
TO R VOL.
GND

TO VOLTAGE AMP ASSY CN302 (→SCH-5)

VOLUME ACW-133

TO PHONO BALANCE ASSY CN503 (→SCH-3)

TO PHONO BALANCE ASSY CN504 (→SCH-3)

CN501 CN502

TO PHONO BALANCE ASSY (→SCH-3)

PHONO L GND GND PHONO R

TO PHONO BALANCE ASSY CN509 (→SCH-3)

TO PHONO BALANCE ASSY CN510 (→SCH-3)

L.BL GND R.BL GND

TO REAR BOX

L PHONO R

TO PHONO BALANCE ASSY CN512 (→SCH-3)

J102: +12V, CD, LINE, TAPE1, TAPE2, SOURCE1, REC2->1, SOURCE2, REC1->2, TUNER

RY109 LINE L
RY110 LINE R
RY107 TAPE2 L
RY108 TAPE2 R
RY105 TAPE1 L
RY106 TAPE1 R
RY101 CD L
RY102 CD R
RY103 TUNER L
RY104 TUNER R
RY113 REC2->1 L
RY114 REC2->1 R
RY117 REC1->2 L
RY118 REC1->2 R
RY119 REC SOURCE TP2 L
RY120 REC SOURCE TP2 R
RY115 REC SOURCE TP1 L
RY116 REC SOURCE TP1 R

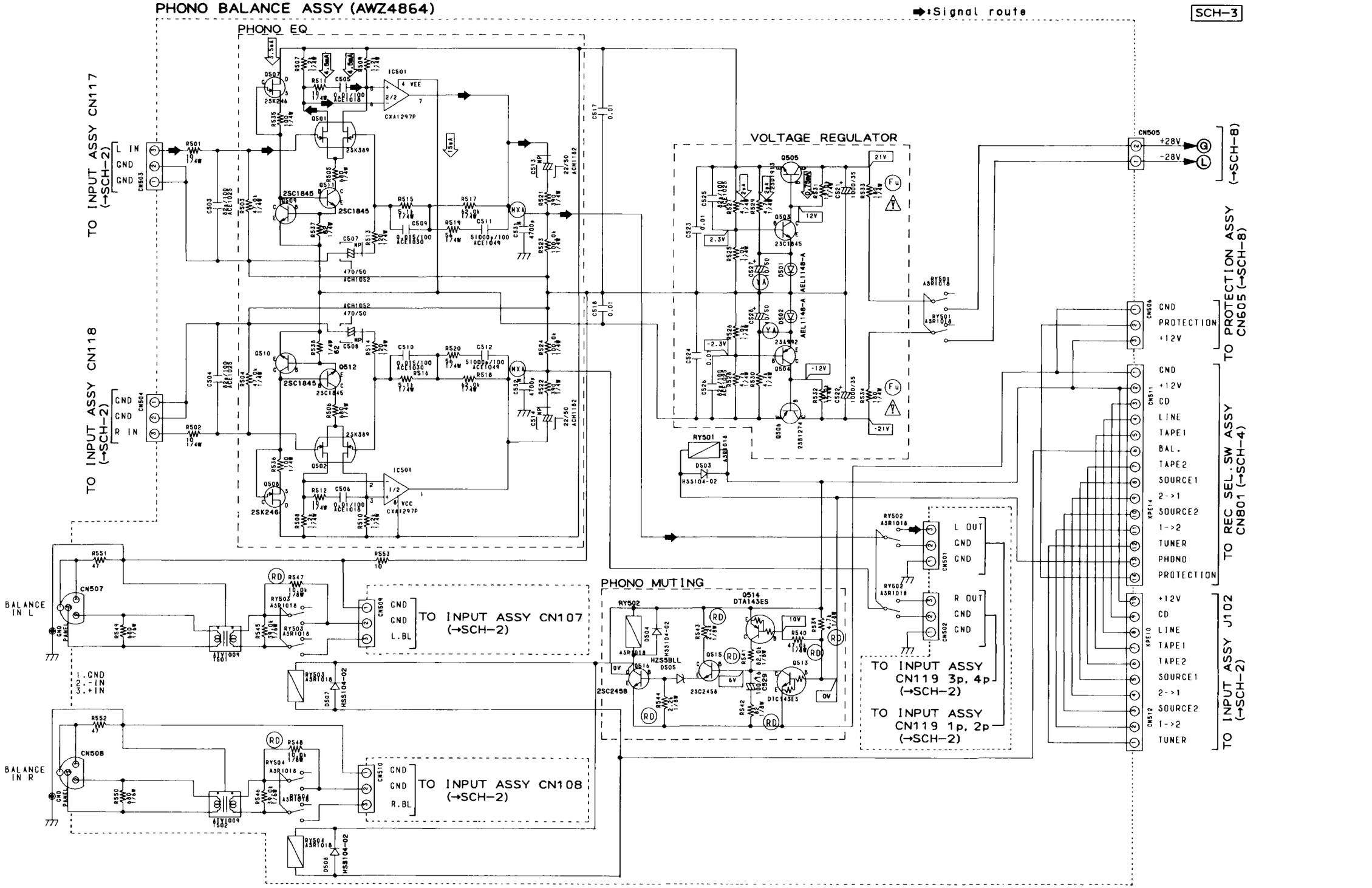
INPUT ASSY

SCH-2

INPUT ASSY

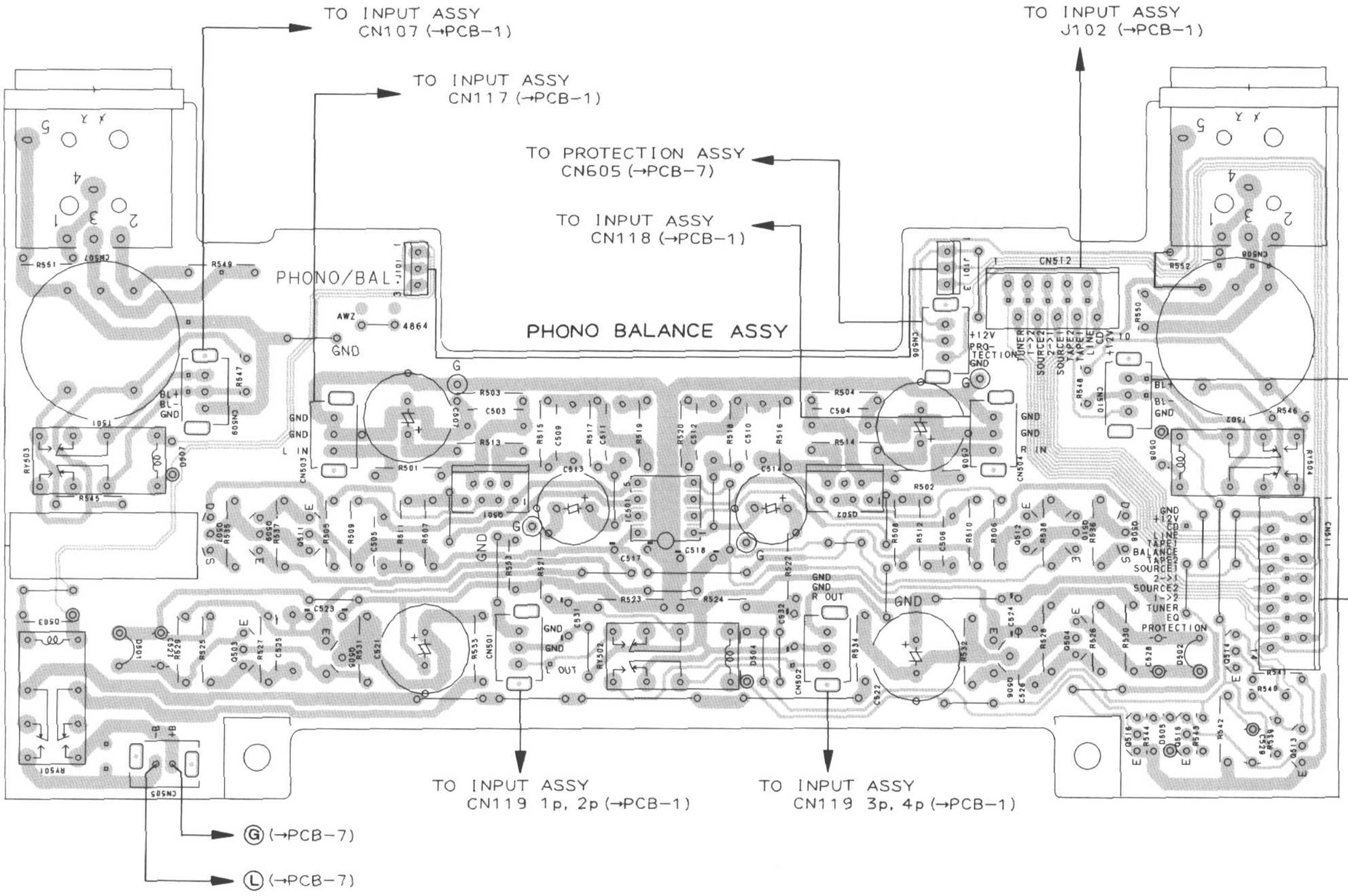
SCH-2

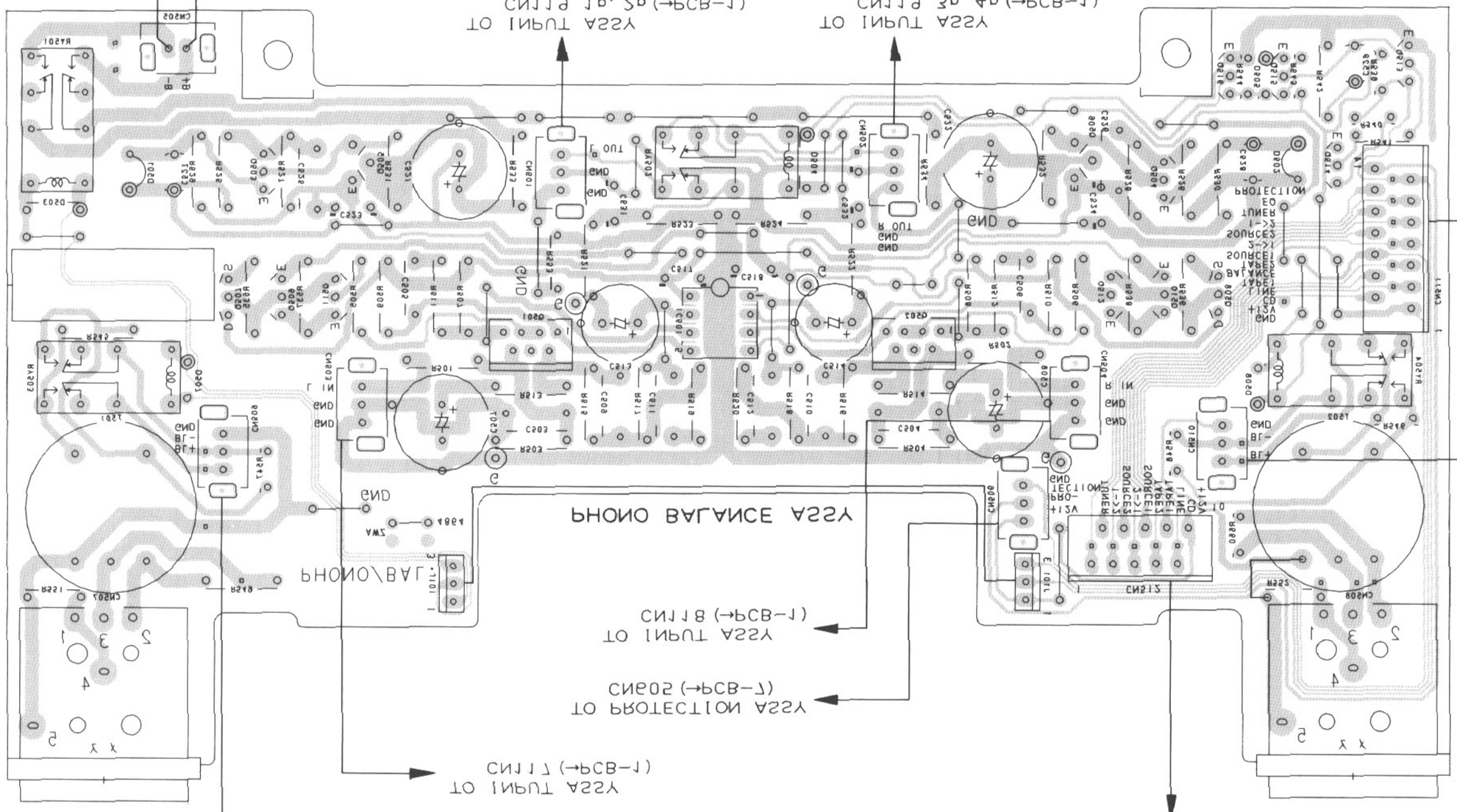
2.3 PHONO BALANCE ASSEMBLY



● This diagram is viewed from the mounted parts side.

PCB-2




TO INPUT ASSY (→PCB-F) CN801
TO REC SEL.SW ASSY (→PCB-E) CN807
TO INPUT ASSY (→PCB-F) CN805
TO INPUT ASSY (→PCB-F) CN804
TO PROTECTION ASSY (→PCB-F) CN802
TO INPUT ASSY (→PCB-F) CN803
TO INPUT ASSY (→PCB-F) CN806
PHONO BALANCE ASSY
TO INPUT ASSY (→PCB-F) CN808
TO INPUT ASSY (→PCB-F) CN809
PCB-S

● This diagram is viewed from the foil side.

2.4 FUNCTION SW, LED AND REC SEL. SW ASSEMBLIES

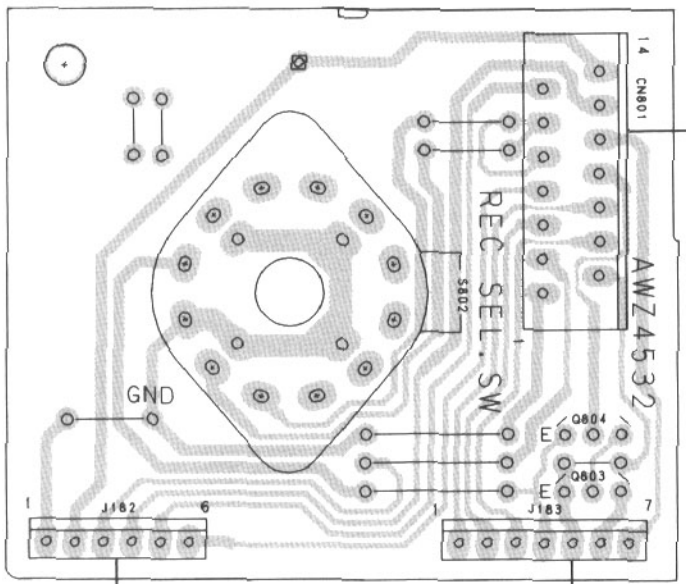
- This diagram is viewed from the foil side.

PCB-3

● *This diagram is viewed from the mounted parts side.*

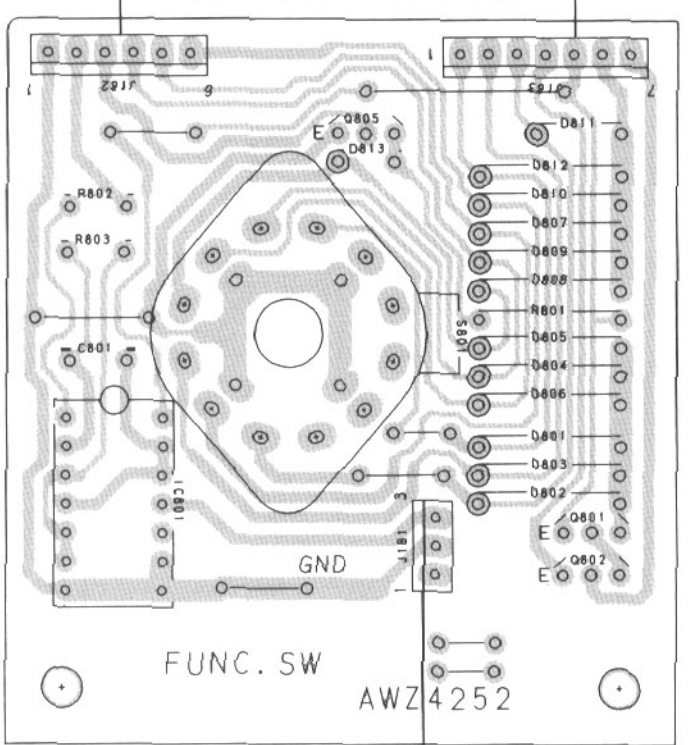
PCB–3

REC SEL. SW ASSY

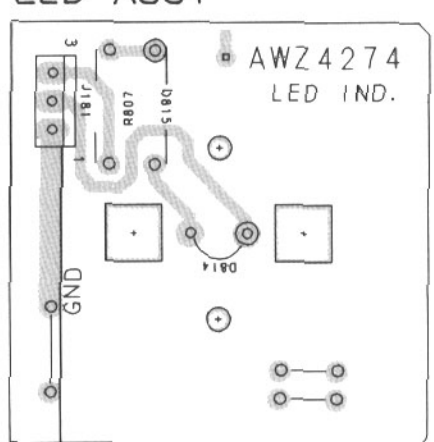


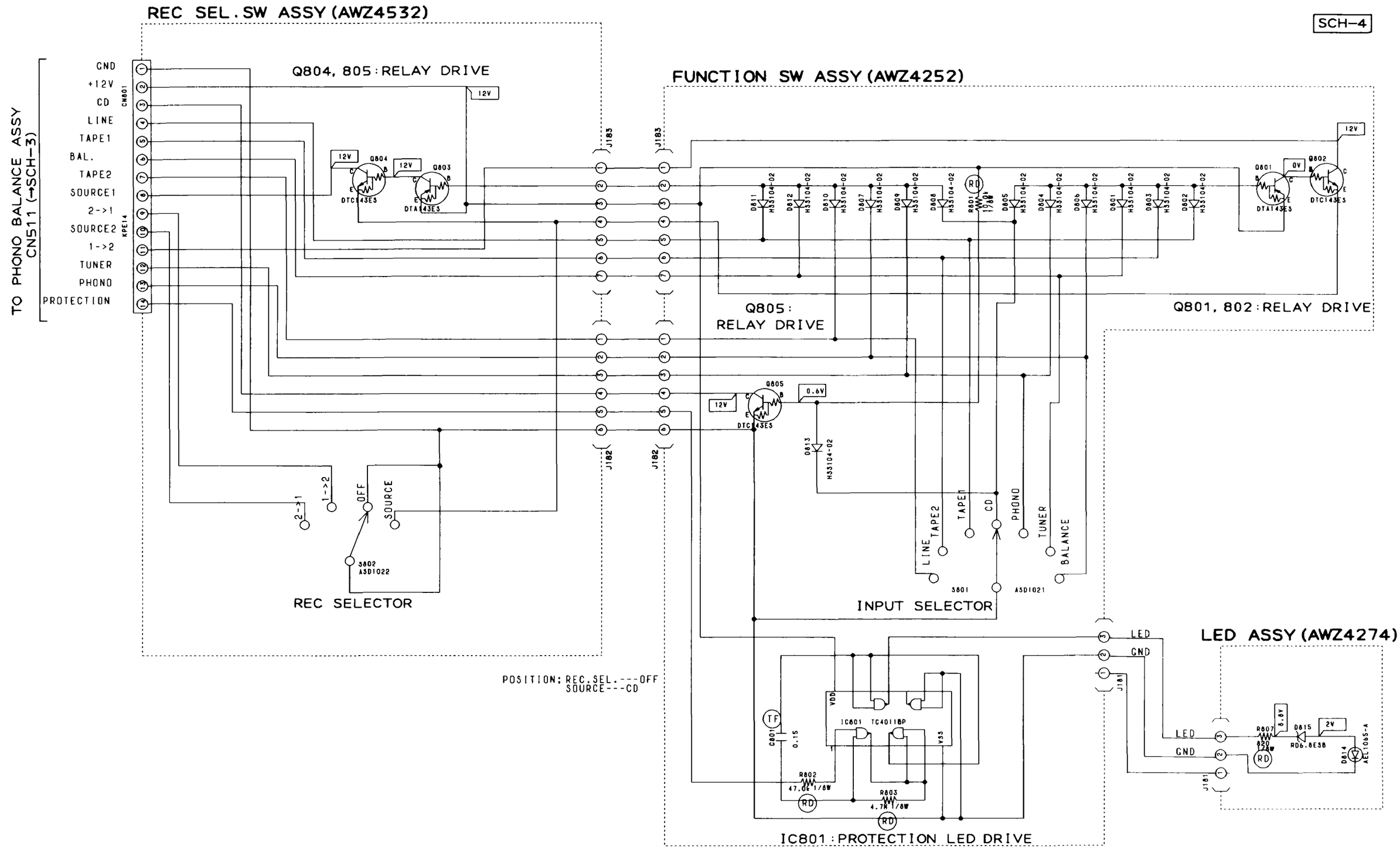
TO PHONO BALANCE ASSY
CN511 (→PCB–2)

FUNCTION SW ASSY



LED ASSY

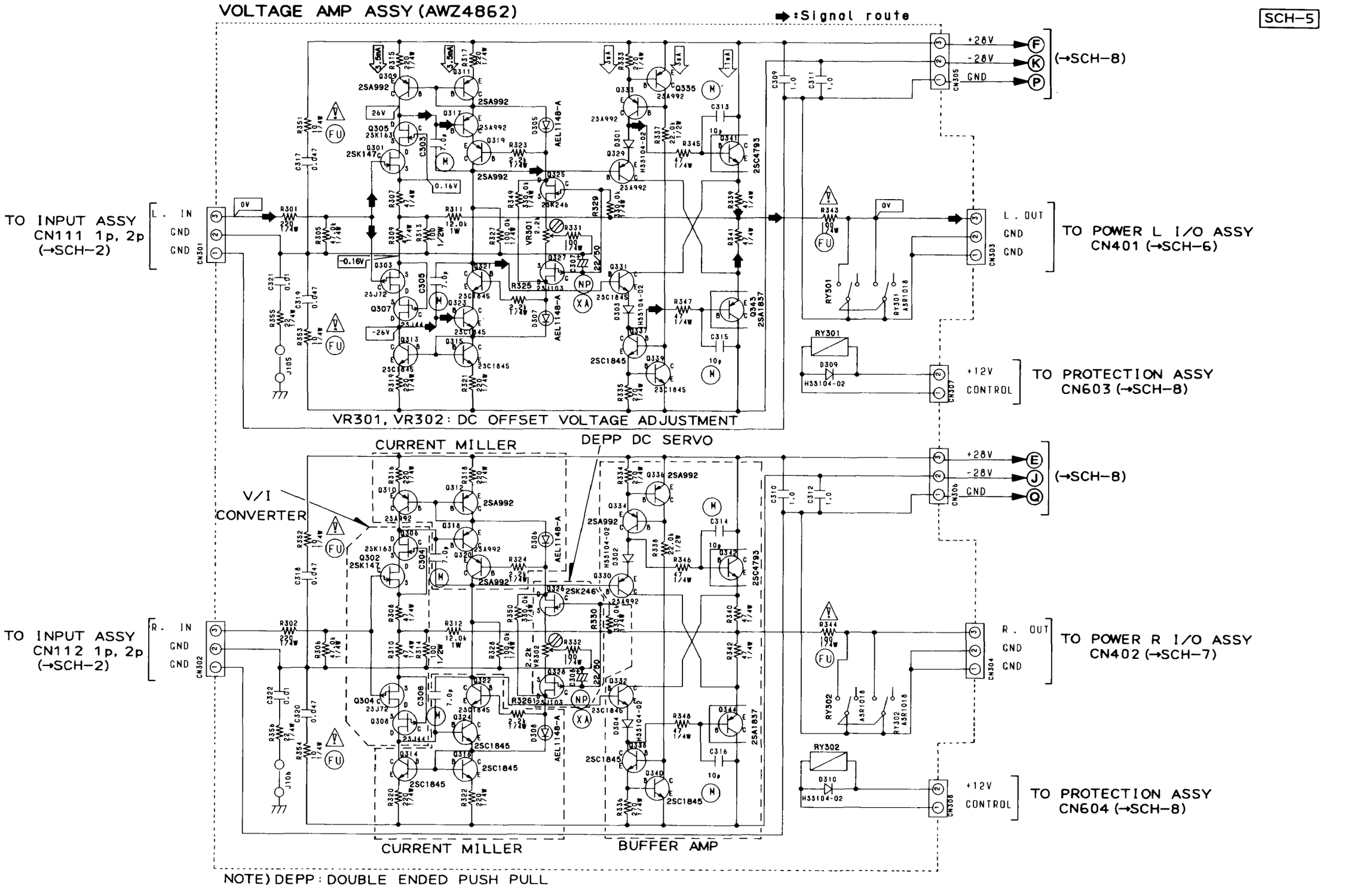




SCH-4 FUNCTION SW ASSY, LED ASSY, REC SEL. SW ASSY

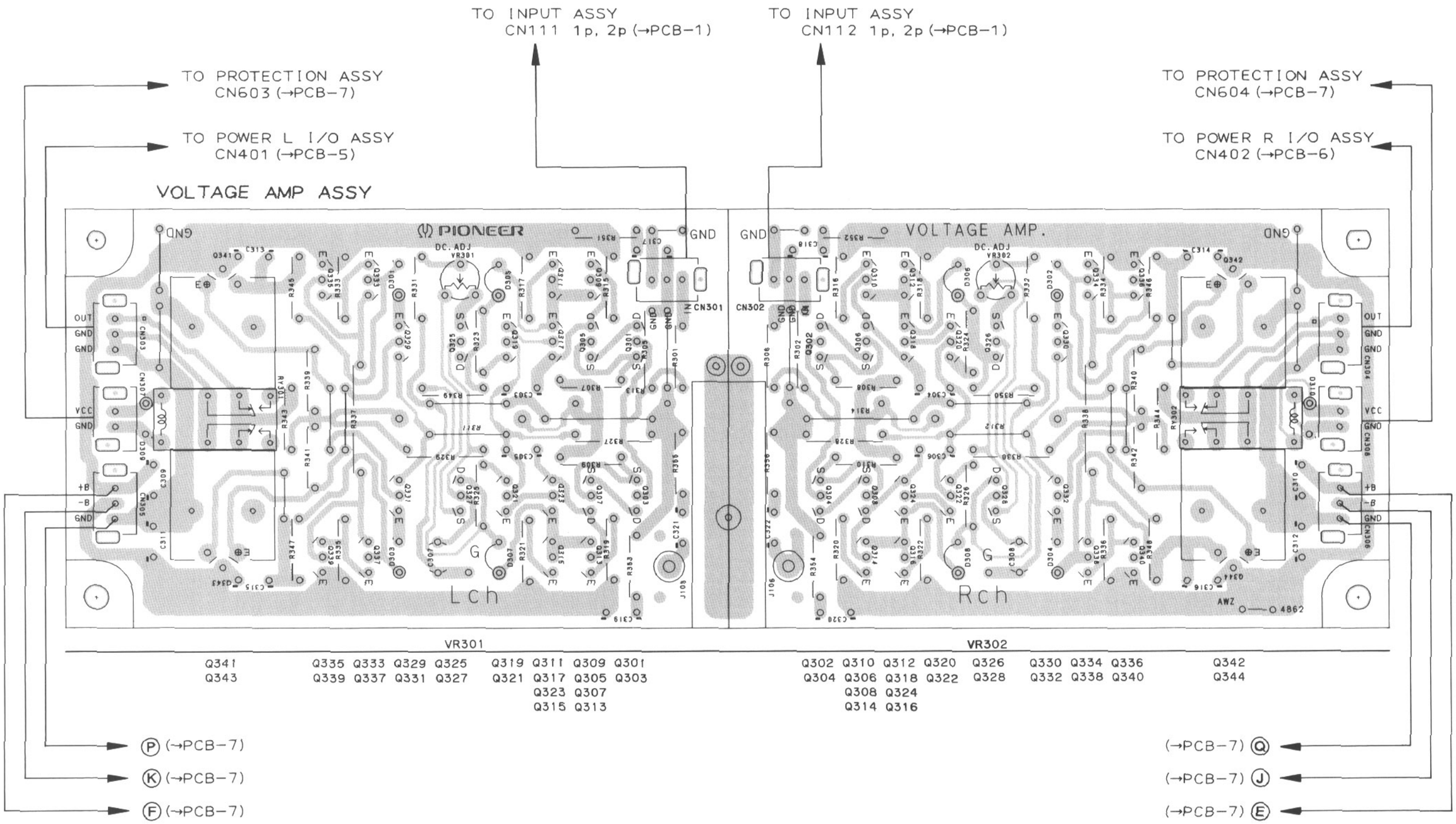
FUNCTION SW ASSY, LED ASSY, REC SEL. SW ASSY **SCH-4**

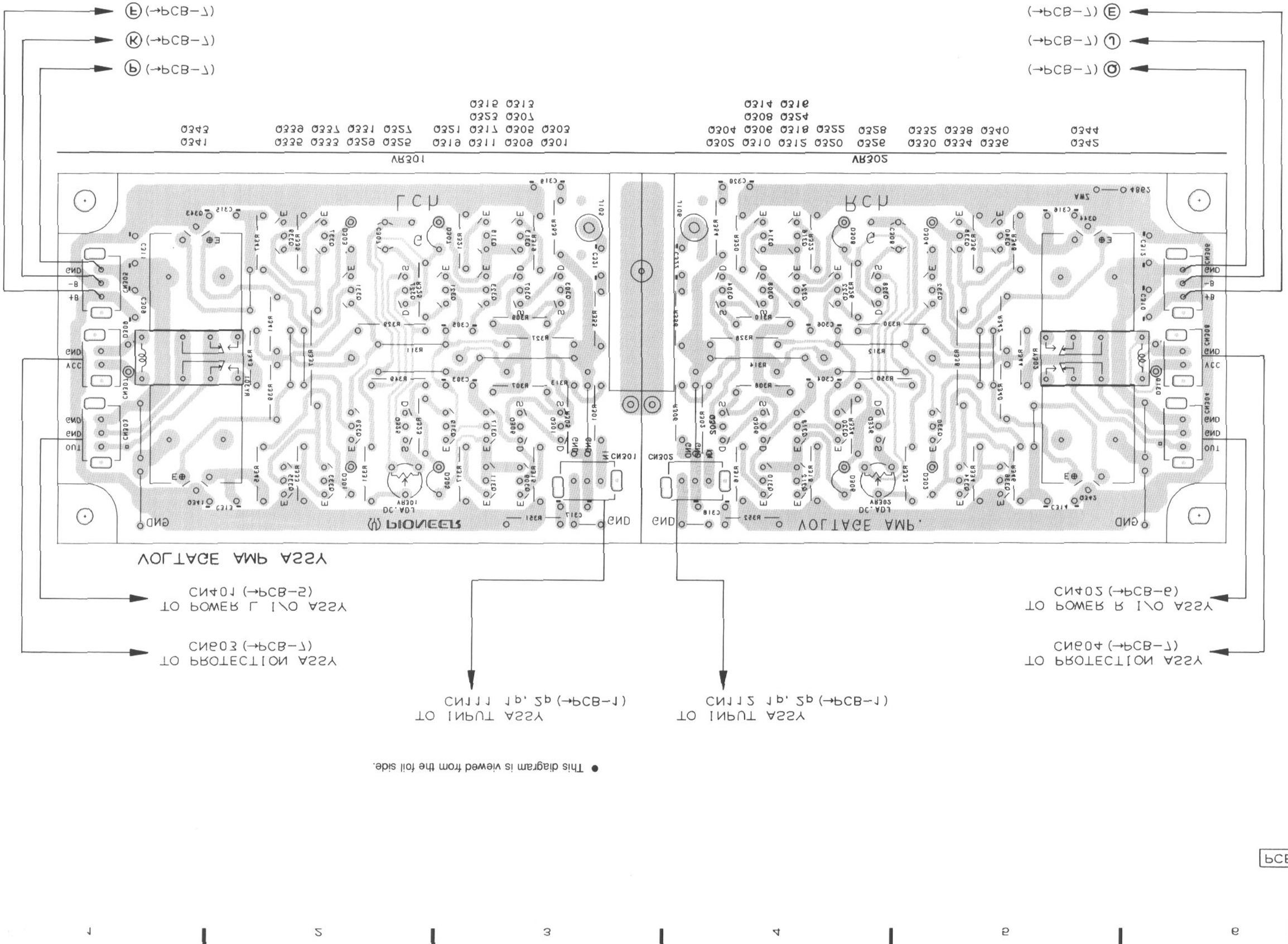
2.5 VOLTAGE AMP ASSEMBLY



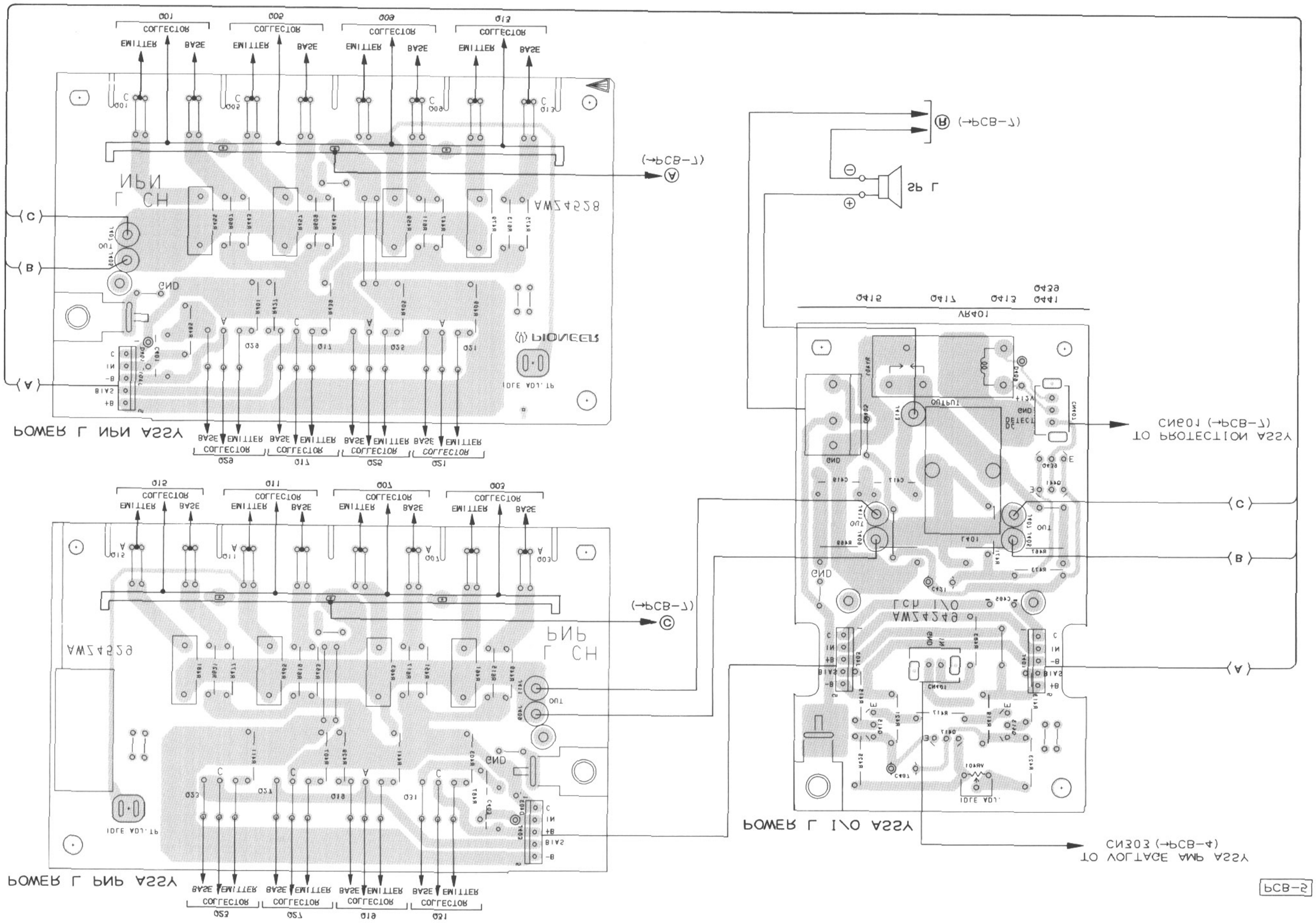
PCB-4

- This diagram is viewed from the mounted parts side.




VOLTAGE AMP. ASSY
PCB-4
TO INPUT ASSY (PCB-1) CN111 p1, 2, p2
TO INPUT ASSY (PCB-1) CN112 p1, 2, p2
TO PROTECTION ASSY (PCB-1) CN604
TO POWER R I\O ASSY (PCB-3) CN405
TO PROTECTION ASSY (PCB-1) CN603
TO POWER L I\O ASSY (PCB-2) CN401
VOLTAGE AMP ASSY
(PCB-1) E
(PCB-1) L
(PCB-1) O
(PCB-1) K
(PCB-1) H
● This diagram is viewed from the foil side.
90-A

2.6 POWER L I/O, POWER L NPN AND POWER L PNP ASSEMBLIES



● This diagram is viewed from the foil side.

● This diagram is viewed from the mounted parts side.

PCB-5

POWER L PNP ASSY

AWZ4529

L CH PNP

POWER L NPN ASSY

AWZ4528

L CH NPN

POWER L I/O ASSY

AWZ4249 Lch I/O

TO VOLTAGE AMP ASSY CN303 (→PCB-4)

TO PROTECTION ASSY CN601 (→PCB-7)

Ⓒ (→PCB-7)

Ⓐ (→PCB-7)

Ⓡ (→PCB-7)

SP L

VR401

Q415 Q417 Q413 Q441 Q439

SCH-6

POWER L NPN ASSY (AWZ4528)

➡ :Signal route

Ⓐ (→SCH-8)

+28V

+B
BIAS
-B
IN
C
J401

Q25 2SA1837
Q21 2SA1837
D401 HS3104-02
R405 36mA
R409 30mA
R401 2.2Ω 1/4W
R485 10Ω 1/4W
Q29 2SA1837
C401 ACE1014
0.6V
0.7V
R427 10Ω 1/4W
Q17 2SC4793
R607 R443 Q01 2SC3182N
R609 R445 Q05 2SC3182N
R611 R447 Q09 2SC3182N
R613 R475 Q13 2SC3182N
375mA
83mV
R455 R457 R459 R479 0.22Ω ACN1096
IDLE CHECK
R439 3.9Ω 1/4W

TO VOLTAGE AMP ASSY CN303 (→SCH-5)

L.IN
GND
CN401
R483 68Ω 1/4W
J401
J403
1.7mA
R419 10.0k 1/4W
0.9V
2SC2705 Q413
27.3V
R413 10k 1/4W
C405 0.1
TF
XA
C407 100/25
R417 47Ω 1/4W
R415 10k 1/4W
-27.3V
Q415 2SA1145
-0.9V
R423 1.0k 1/4W
VR401 1.0k
-0.4V
Q411 2SC2705
R425 10k 1/4W
R421 10.0k 1/4W

VR401 : IDLE CURRENT ADJUSTMENT

POWER L I/O ASSY (AWZ4249)

RY401 A5R1027
D409 HSS104-02
+12V
CONTROL
DC DETECT
CN407
12V
2SC1845 Q439
Q441 2SC1845
R471 10.0k 1/4W
R473 1k 1/4W
C421 47Ω/6
L401 ATH-066
R467 3Ω R33LMF
0V
J405
J407
J409
J411
C419 C417 ACE1019
R469 10Ω 1/4W R33LMF ACE1019
Q439, Q441: DC DETECTOR
J413
L. OUT
SP L
GND
GND
GND
CN405
AKM-056
Ⓡ (→SCH-8)

TO PROTECTION ASSY CN601 (→SCH-8)

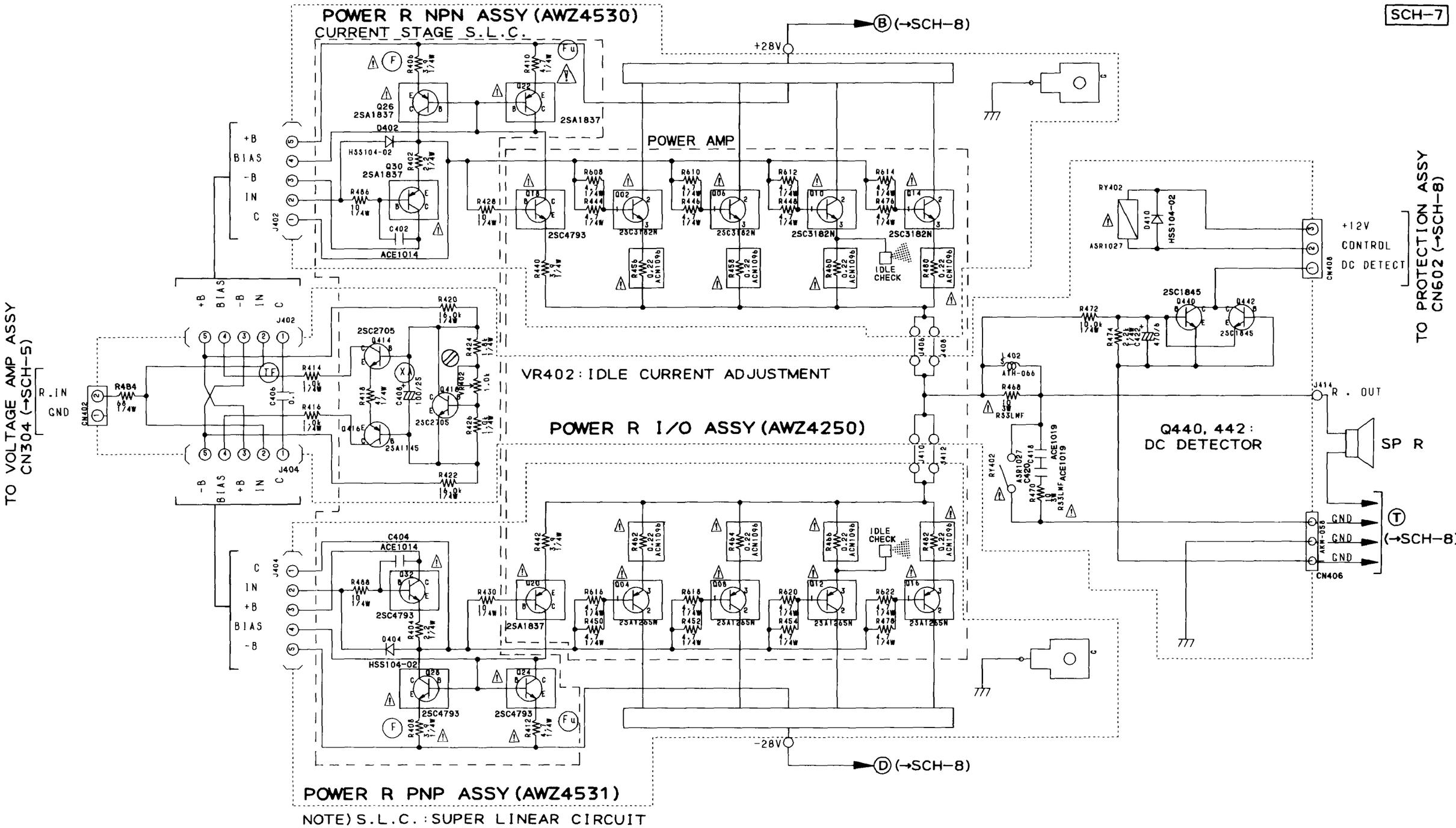
C403 ACE1014
Q31 2SC4793
R467 10Ω 1/4W
-0.6V
D403 HSS104-02
R403 2.2Ω 1/4W
Q27 2SC4793
R407 3.9Ω 1/4W
F
Fu
R429 10Ω 1/4W
Q19 2SA1837
-0.7V
R441 3.9Ω 1/4W
Q23 2SC4793
R411 4.7Ω 1/4W
-83mV
R461 R463 R465 R481 0.22Ω ACN1096
IDLE CHECK
R615 R449 Q03 2SA1265N
R617 R451 Q07 2SA1265N
R619 R453 Q11 2SA1265N
R621 R477 Q15 2SA1265N

-28V

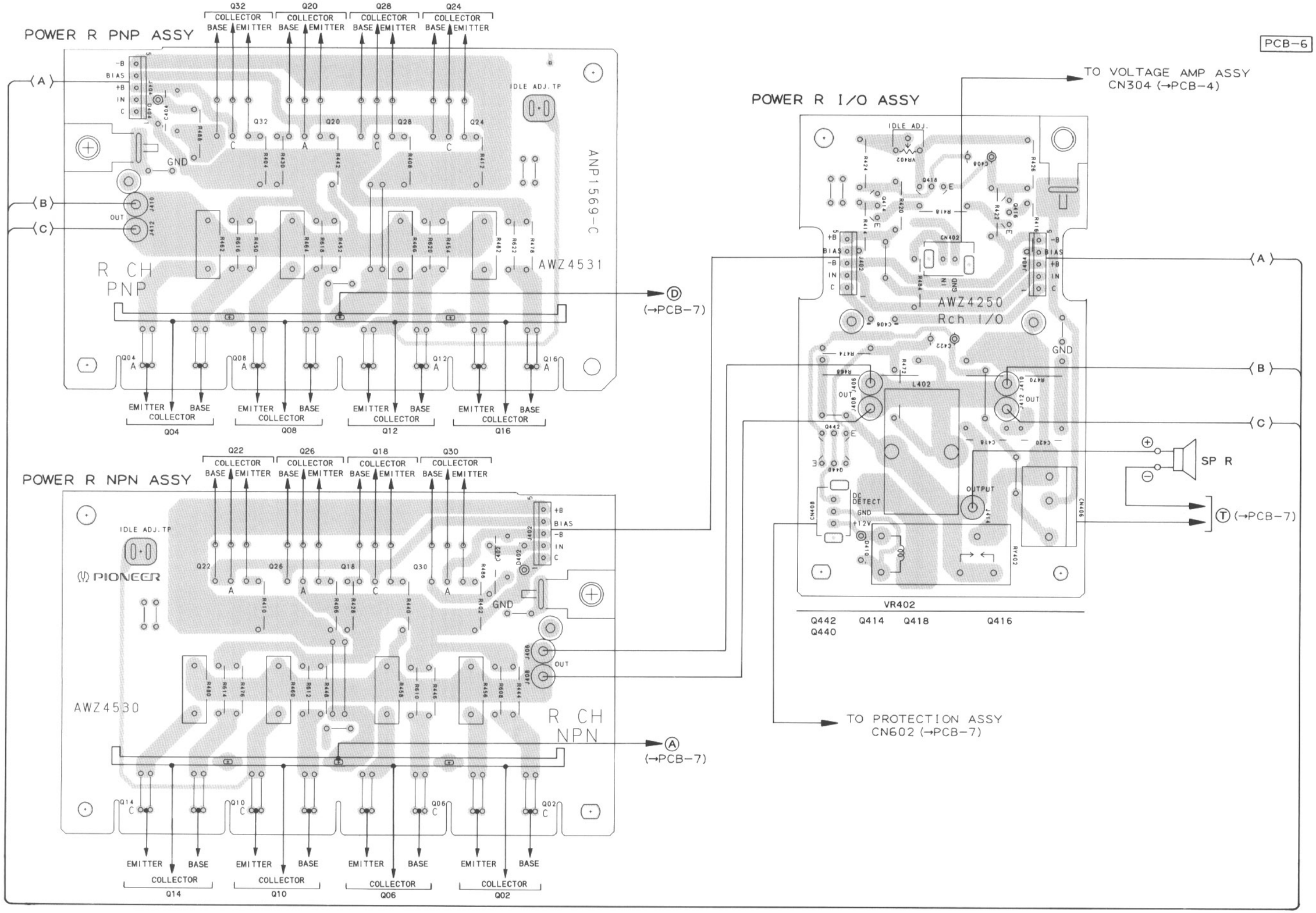
Ⓒ (→SCH-8)

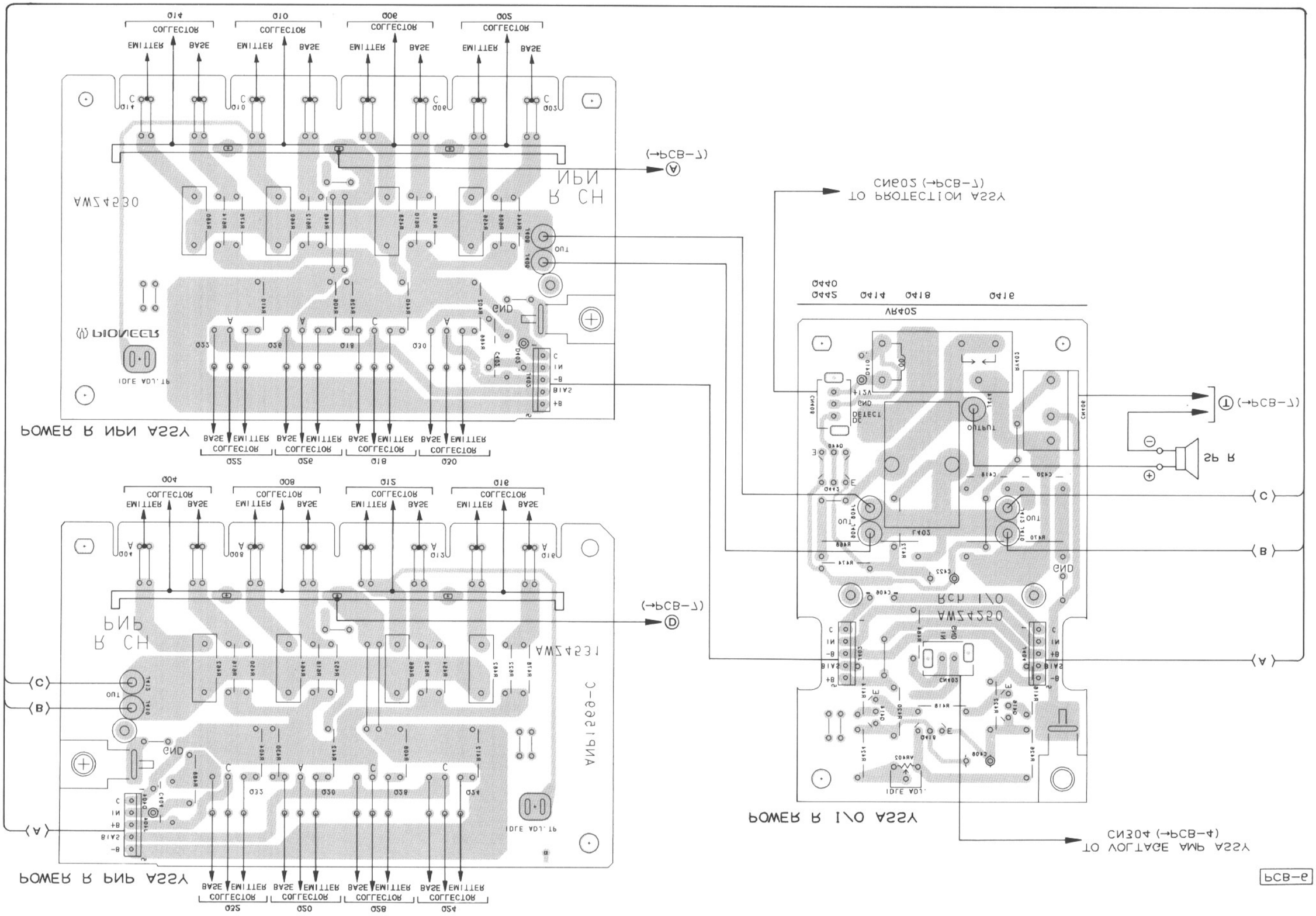
POWER L PNP ASSY (AWZ4529)

2.7 POWER R I/O, POWER R NPN AND POWER R PNP ASSEMBLIES



● This diagram is viewed from the mounted parts side.

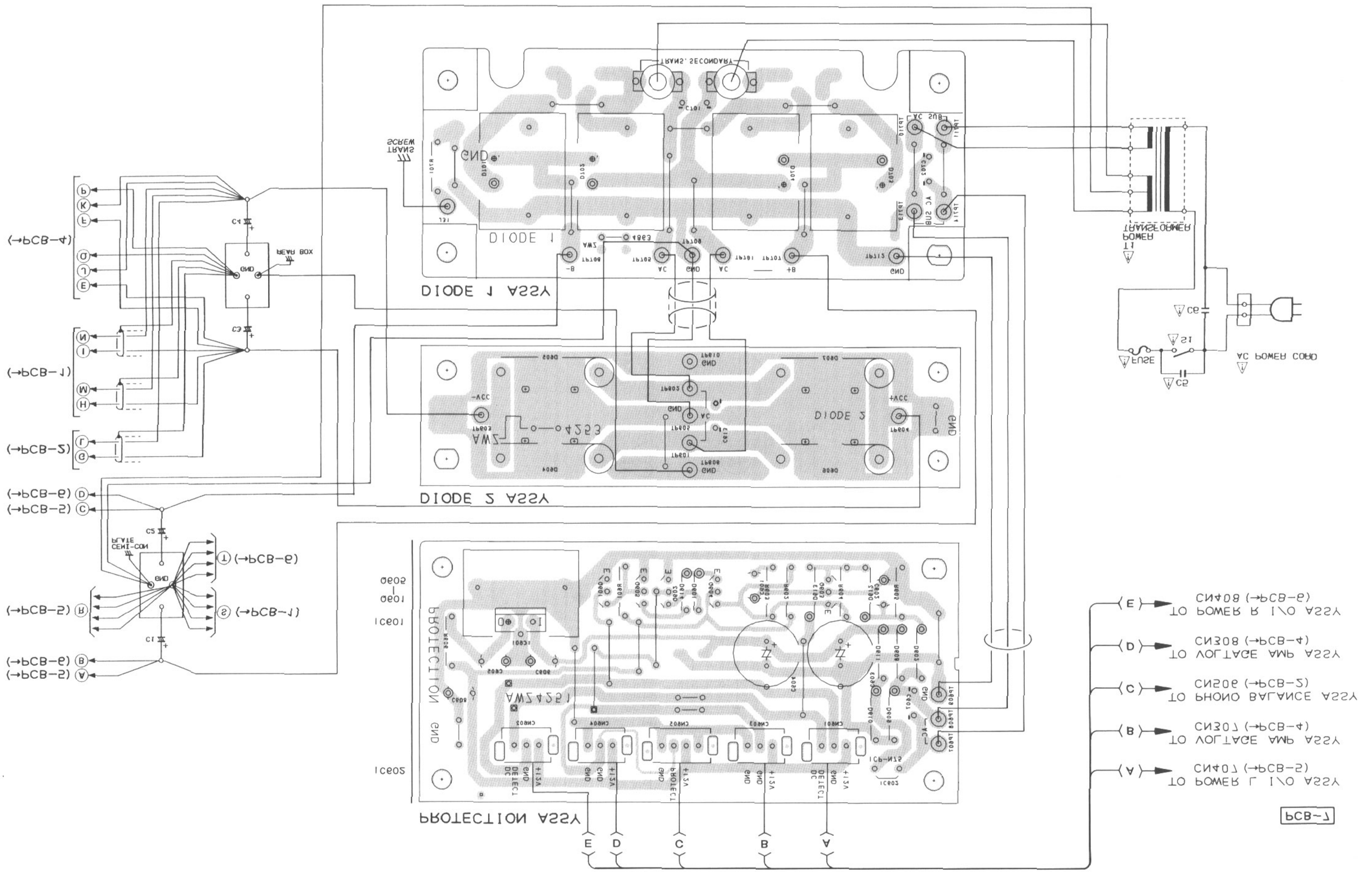




● This diagram is viewed from the foil side.

2.8 PROTECTION, DIODE 1 AND DIODE 2 ASSEMBLIES

● This diagram is viewed from the foil side.



- This diagram is viewed from the mounted parts side.

PCB-7

(A) → TO POWER L I/O ASSY CN407 (→PCB-5)

(B) → TO VOLTAGE AMP ASSY CN307 (→PCB-4)

(C) → TO PHONO BALANCE ASSY CN506 (→PCB-2)

(D) → TO VOLTAGE AMP ASSY CN308 (→PCB-4)

(E) → TO POWER R I/O ASSY CN408 (→PCB-6)

PROTECTION ASSY

AWZ4251

DIODE 2 ASSY

AWZ 4253

DIODE 1 ASSY

AWZ 4863

(→PCB-5) (A)
(→PCB-6) (B)
(→PCB-5) (R)
(S) (→PCB-1)
(T) (→PCB-6)
(→PCB-5) (C)
(→PCB-6) (D)
(→PCB-2) (G) (L)
(→PCB-1) (H) (M) (I) (N)
(→PCB-4) (E) (J) (Q) (F) (K) (P)

CEMI-CON PLATE
REAR BOX
TRANS SCREW
TRANS. SECONDARY

FUSE
C5
C6
S1
AC POWER CORD
T1 POWER TRANSFORMER

SCH-8

PROTECTION ASSY (AWZ4251)

CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE. REPLACE WITH SAME TYPE NO. ICP-N75, MFD BY ROHM CO., LTD. FOR IC602.

TO POWER L I/O ASSY CN407 (→SCH-6)

TO POWER R I/O ASSY CN408 (→SCH-7)

TO PHONO BALANCE ASSY CN506 (→SCH-3)

TO VOLTAGE AMP ASSY CN308 (→SCH-5)

TO VOLTAGE AMP ASSY CN307 (→SCH-5)

IC601 : VOLTAGE REGULATOR

Q601, 602, 605 : RELAY DRIVE

(→SCH-6) Ⓐ
(→SCH-7) Ⓑ
(→SCH-6) Ⓡ Ⓢ (→SCH-2)
Ⓣ (→SCH-7)
(→SCH-6) Ⓒ
(→SCH-7) Ⓓ

(→SCH-3) Ⓖ Ⓛ
(→SCH-2) Ⓗ Ⓜ Ⓘ Ⓝ
(→SCH-5) Ⓔ Ⓙ Ⓠ Ⓕ Ⓚ Ⓟ

DIODE 2 ASSY (AWZ4253)

DIODE 1 ASSY (AWZ4863)

POWER TRANSFORMER ⚠ T1 ATS1487

⚠ FUSE AEK-512

⚠ S1 ASG-553

⚠ C5 ACG1003

⚠ C6 ACG1003

AC POWER CORD ADG1093 AC220-230V 50/60Hz

PROTECTION ASSY, DIODE 1 ASSY, DIODE 2 ASSY SCH-8

3. PCB PARTS LIST

NOTES:

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by " ◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	→ *56×10¹*	→ *561* ·····	*RD1/8PM 5 6 1 J*
47kΩ	→ *47×10³*	→ *473* ·····	*RD1/4PS 4 7 3 J*
0.5Ω	→ *0R5* ·····		*RN2H 0 R 5 K*
1Ω	→ *010* ·····		*RS1P 0 1 0 K*

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	→ *562×10¹*	→ *5621* ·····	*RN1/4PC 5 6 2 1 F*

Mark	No.	Description	Parts No.	Mark

LIST OF ASSEMBLIES

NSP	POWER AMP ASSY		AWH1033	
◉	├	POWER L I/O ASSY	AWZ4249	
◉	├	POWER R I/O ASSY	AWZ4250	
◉	├	PROTECTION ASSY	AWZ4251	
◉	├	FUNCTION SW ASSY	AWZ4252	
◉	├	DIODE 2 ASSY	AWZ4253	
◉	├	LED ASSY	AWZ4274	
◉	├	POWER L NPN ASSY	AWZ4528	
◉	├	POWER L PNP ASSY	AWZ4529	
◉	├	POWER R NPN ASSY	AWZ4530	
◉	├	POWER R PNP ASSY	AWZ4531	
◉	└	REC SEL. SW ASSY	AWZ4532	
NSP	AF COMPLEX ASSY		AWK1863	
	├	INPUT ASSY	AWZ4861	
	├	VOLTAGE AMP ASSY	AWZ4862	
	├	DIODE 1 ASSY	AWZ4863	
	└	PHONO BALANCE ASSY	AWZ4864	

POWER L I/O ASSY

SEMICONDUCTORS

	Q415		2SA1145
	Q439,Q441		2SC1845
	Q413,Q417		2SC2705
	D409		HSS104−02

COILS AND FILTERS

	L401	(0.46UH)	ATH−066

SWITCHES AND RELAYS

⚠	RY401		ASR1027

CAPACITORS

	C417,C419	(0.1/DC100V)	ACE1019
	C421		CEAS471M6
	C407		CEXA101M25
	C405		CFTXA104J50

RESISTORS

	R413,R415,R425		RDR1/4PM102J
	R471		RDR1/4PM103J
	R419,R421		RDR1/4PM163J
	R423		RDR1/4PM182J
	R473		RDR1/4PM222J
	R417		RDR1/4PM470J
	R483		RDR1/4PM680J
⚠	R467,R469		RS3LMF100J
	VR401		VRTS6HS102

OTHERS

	CN405	PLUG 3−P	AKM−058

POWER R I/O ASSY

SEMICONDUCTORS

	Q416		2SA1145
	Q440,Q442		2SC1845
	Q414,Q418		2SC2705
	D410		HSS104−02

COILS AND FILTERS

	L402	(0.46UH)	ATH−066

SWITCHES AND RELAYS

⚠	RY402		ASR1027

CAPACITORS

	C418,C420	(0.1/DC100V)	ACE1019
	C422		CEAS471M6
	C408		CEXA101M25
	C406		CFTXA104J50

RESISTORS

	R414,R416,R426		RDR1/4PM102J
	R472		RDR1/4PM103J
	R420,R422		RDR1/4PM163J
	R424		RDR1/4PM182J
	R474		RDR1/4PM222J
	R418		RDR1/4PM470J
	R484		RDR1/4PM680J
⚠	R468,R470		RS3LMF100J
	VR402		VRTS6HS102

OTHERS

	CN406	PLUG 3−P	AKM−058

Mark	No.	Description	Parts No.	Mark
PROTECTION ASSY				
SEMICONDUCTORS				
⚠	IC602		ICP−N75	
	IC601		UPC78M12AHF	
	Q603		2SA1145	
	Q604		2SC2458	
	Q601,Q602,Q605		DTC143ES	
	D612,D613		HSS104−02	
	D614		RD4.7ESB2	
	D601		RD5.1ESB1	
	D602,D608−D611		S5566	
CAPACITORS				
	C607		ACG1005	
	C603,C604		CEAS102M25	
	C601		CEAS220M50	
	C602		CEAS3R3M50	
	C605,C606		CEHAQ100M50	
	C608		CEXA100M50	
RESISTORS				
	R606		RD1/2PM010J	
		Other Resistors	RD1/4PM□□□J	
OTHERS				
		SCREW	PMB30P100FCU	
FUNCTION SW ASSY				
SEMICONDUCTORS				
	IC801		TC4011BP	
	Q801		DTA143ES	
	Q802,Q805		DTC143ES	
	D801−D813		HSS104−02	
SWITCHES AND RELAYS				
	S801		ASD1021	
CAPACITORS				
	C801		CFTXA154J50	
RESISTORS				
		All Resistors	RD1/8PM□□□J	
DIODE 2 ASSY				
SEMICONDUCTORS				
⚠	D604−D607		31DF2FC	
CAPACITORS				
	C613		ACG1005	
LED ASSY				
SEMICONDUCTORS				
	D814		AEL1065	
	D815		RD6.8ESB	
RESISTORS				
		All Resistors	RD1/8PM□□□J	
POWER L NPN ASSY				
SEMICONDUCTORS				
	D401		HSS104−02	
CAPACITORS				
	C401	(220P/DC100V)	ACE1014	

Mark	No.	Description	Parts No.	Mark
RESISTORS				
⚠	R455,R457,R459,R479	(0.22/5W)	ACN1096	
	R427,R485		RDR1/4PM100J	
	R401		RDR1/4PM2R2J	
	R439		RDR1/4PM3R9J	
	R443,R445,R447,R475,R607		RDR1/4PM4R7J	
	R609,R611,R613		RDR1/4PM4R7J	
⚠	R409		RFA1/4PS4R7J	
⚠		Other Resistors	RD1/4PM□□□J	
POWER L PNP ASSY				
SEMICONDUCTORS				
	D403		HSS104−02	
CAPACITORS				
	C403	(220P/DC100V)	ACE1014	
RESISTORS				
⚠	R461,R463,R465,R481	(0.22/5W)	ACN1096	
	R429,R487		RDR1/4PM100J	
	R403		RDR1/4PM2R2J	
	R441		RDR1/4PM3R9J	
	R449,R451,R453,R477,R615		RDR1/4PM4R7J	
	R617,R619,R621		RDR1/4PM4R7J	
⚠	R411		RFA1/4PS4R7J	
⚠		Other Resistors	RD1/4PM□□□J	
POWER R NPN ASSY				
SEMICONDUCTORS				
	D402		HSS104−02	
CAPACITORS				
	C402	(220P/DC100V)	ACE1014	
RESISTORS				
⚠	R456,R458,R460,R480	(0.22/5W)	ACN1096	
	R428,R486		RDR1/4PM100J	
	R402		RDR1/4PM2R2J	
	R440		RDR1/4PM3R9J	
	R444,R446,R448,R476,R608		RDR1/4PM4R7J	
	R610,R612,R614		RDR1/4PM4R7J	
⚠	R410		RFA1/4PS4R7J	
⚠		Other Resistors	RD1/4PM□□□J	
POWER R PNP ASSY				
SEMICONDUCTORS				
	D404		HSS104−02	
CAPACITORS				
	C404	(220P/DC100V)	ACE1014	
RESISTORS				
⚠	R462,R464,R466,R482	(0.22/5W)	ACN1096	
	R430,R488		RDR1/4PM100J	
	R404		RDR1/4PM2R2J	
	R442		RDR1/4PM3R9J	
	R450,R452,R454,R478,R616		RDR1/4PM4R7J	
	R618,R620,R622		RDR1/4PM4R7J	
⚠	R412		RFA1/4PS4R7J	
⚠		Other Resistors	RD1/4PM□□□J	

Mark	No.	Description	Parts No.

REC SEL. SW ASSY

SEMICONDUCTORS

	Q803	DTA143ES
	Q804	DTC143ES

SWITCHES AND RELAYS

	S802	ASD1022

OTHERS

	CN801	CONNECTOR(14P) KPE14

INPUT ASSY

SEMICONDUCTORS

	Q117,Q118	2SJ44
	Q113,Q114	2SJ72
	Q111,Q112	2SK147
	Q115,Q116	2SK163
	D101－D110,D113－D120	HSS104－02

COILS AND FILTERS

	L101,L102 (270UH)	ATH1010

SWITCHES AND RELAYS

	RY101－RY110	ASR1018
	RY113－RY120	ASR1040

CAPACITORS

	C101,C102 (82P/DC100V)	ACE1025
	C111,C112	ACH1182
	C105－C110,C115,C116	CCCSL181K500
	C117－C120	CCCSL390J50
	C103,C104	CCDSL181J50
	C121－C124	CFTYA103J50
	C113,C114	CKCYF103Z50

RESISTORS

	R141,R142	RDR1/4PM101J
	R115,R116,R129－R132	RDR1/4PM221J
	R121－R124	RDR1/4PM470J
	R117,R118	RDR1/4PM473J
	R107－R110	RDR1/6PU102J
	R119,R120	RDR1/6PU272J
	Other Resistors	RD1/8PM□□□J

OTHERS

	CN121－CN136	1P PINJACK AKB1162

VOLTAGE AMP ASSY

SEMICONDUCTORS

	Q343,Q344	2SA1837
	Q309－Q312,Q317－Q320	2SA992
	Q329,Q330,Q333－Q336	2SA992
	Q313－Q316,Q321－Q324	2SC1845
	Q331,Q332,Q337－Q340	2SC1845
	Q341,Q342	2SC4793
	Q327,Q328	2SJ103
	Q307,Q308	2SJ44
	Q303,Q304	2SJ72
	Q301,Q302	2SK147
	Q305,Q306	2SK163
	Q325,Q326	2SK246
	D305－D308	AEL1148
	D301－D304,D309,D310	HSS104－02

Mark	No.	Description	Parts No.

SWITCHES AND RELAYS

	RY301,RY302	ASR1018

CAPACITORS

	C309－C312	ACG1045
	C307,C308	ACH1182
	C321,C322	CKCYF103Z50
	C317－C320	CKCYF473Z50
	C303－C306	CMA070D500
	C313－C316	CMA100D500

RESISTORS

	R313,R314	RDM1/2P101J
	R311,R312	RDM1P123J
	R337,R338	RDR1/2PM223J
	R331,R332	RDR1/4PM101J
	R327,R328	RDR1/4PM104J
	R355,R356	RDR1/4PM220J
	R301,R302,R315－R322	RDR1/4PM221J
	R323－R326	RDR1/4PM222J
	R333－R336	RDR1/4PM271J
	R329,R330,R349,R350	RDR1/4PM334J
	R307－R310,R339－R342	RDR1/4PM470J
	R345－R348	RDR1/4PM470J
	R305,R306	RDR1/4PM473J
⚠	R351－R354	RFA1/4PS100J
⚠	R343,R344	RFA1/4PS101J
	VR301,VR302	VRTS6VS222

OTHERS

	8205	SCREW	PMB30P100FCU

DIODE 1 ASSY

SEMICONDUCTORS

⚠	D701－D704	F10KF20

CAPACITORS

	C701,C702	ACG1005

RESISTORS

	All Resistors	RD1/4PM□□□J

OTHERS

	8307	STAR TERMINAL A	AKE1028
	8310	SCREW	PMB30P100FCU

PHONO BALANCE ASSY

SEMICONDUCTORS

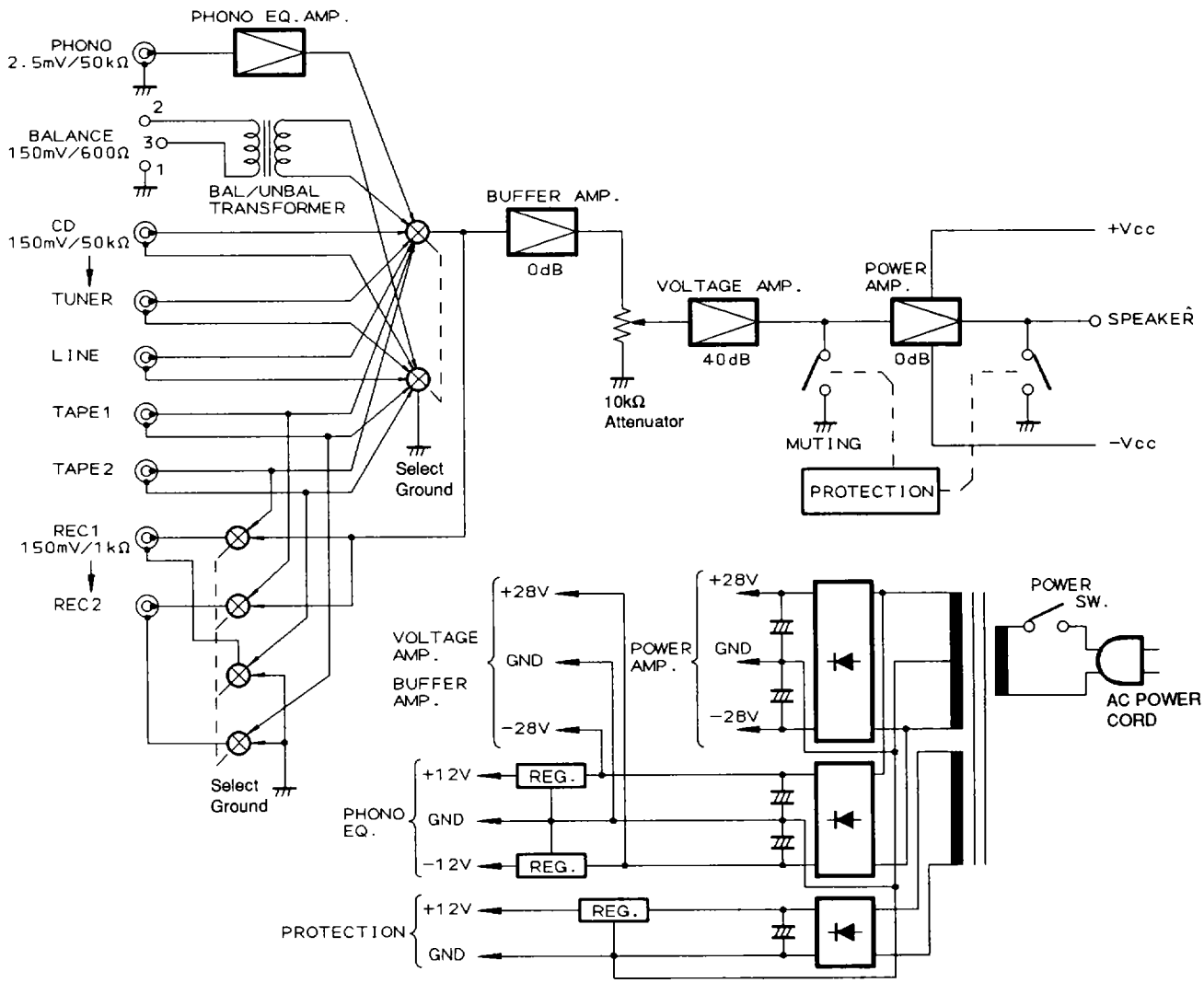
	IC501	CXA1297P
	Q504	2SA992
	Q506	2SB1274
	Q503,Q509－Q512	2SC1845
	Q515,Q516	2SC2458
	Q505	2SD1913
	Q507,Q508	2SK246
	Q501,Q502	2SK389
	Q514	DTA143ES
	Q513	DTC143ES
	D501,D502	AEL1148
	D503,D504,D507,D508	HSS104－02
	D505	HZS5BLL

COILS AND FILTERS

	T501,T502	ATV1009

Mark	No.	Description	Parts No.	Mark
SWITCHES AND RELAYS				
	RY501－RY504		ASR1018	
CAPACITORS				
	C505,C506 (0.01/DC100V)		ACE1018	
	C503,C504,C525,C526 (82P/DC100V)		ACE1025	
	C509,C510 (0.015/DC100V)		ACE1030	
	C511,C512		ACE1049	
	C507,C508 (470/DC50V)		ACH1052	
	C513,C514		ACH1182	
	C529		CEAS101M16	
	C521,C522		CEAS102M35	
	C527,C528		CEYA100M50	
	C517,C518,C523,C524		CKCYF103Z50	
	C531,C532		CQMXA472J100	
RESISTORS				
	R542		RD1/4PM820J	
	R501,R502,R511,R512		RDR1/4PM100J	
	R535,R536		RDR1/4PM101J	
	R525,R526		RDR1/4PM102J	
	R523,R524		RDR1/4PM104J	
	R513,R514		RDR1/4PM121J	
	R507－R510		RDR1/4PM122J	
	R531,R532		RDR1/4PM123J	
	R521,R522		RDR1/4PM391J	
	R527－R530		RDR1/4PM472J	
	R503,R504		RDR1/4PM473J	
	R515,R516		RDR1/4PM512J	
	R519,R520		RDR1/4PM560J	
	R537,R538		RDR1/4PM620J	
	R517,R518		RDR1/4PM623J	
	R505,R506		RDR1/4PM681J	
	R545,R546		RDR1/6PU393J	
	R549,R550		RDR1/6PU681J	
⚠	R533,R534		RFA1/4PS181J	
		Other Resistors	RD1/8PM□□□J	
OTHERS				
	CN512	CONNECTOR(10P)	KPE10	
	CN511	CONNECTOR(14P)	KPE14	

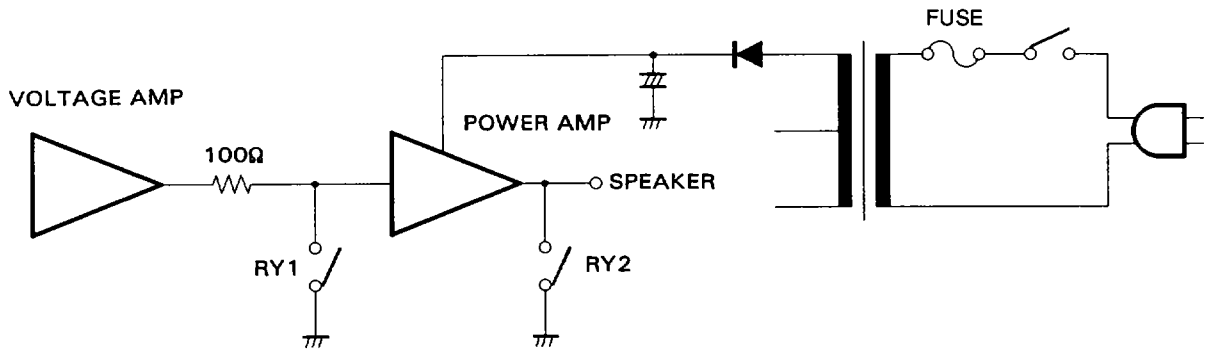
4. BLOCK DIAGRAM



5. CIRCUIT DESCRIPTION

■ PROTECTION CIRCUIT

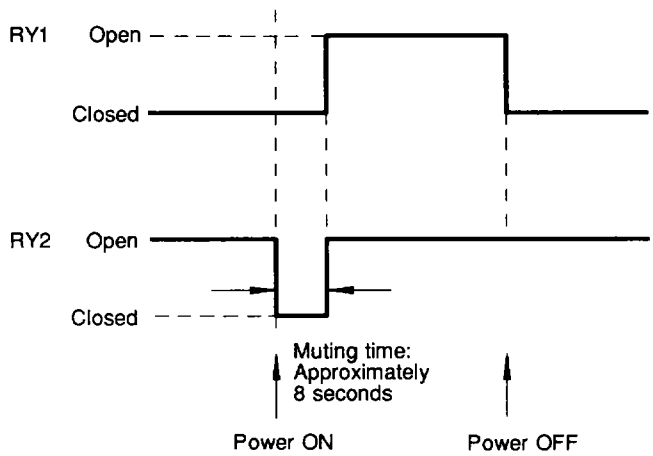
In the A-09, in order to avoid inferior sound quality due to the relay contact point, the relays that normally are serially inserted to the signal line have been eliminated.



● Sequence of RY1 and RY2 at the time of power ON/OFF

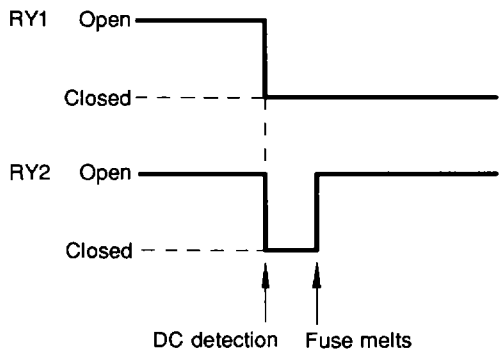
Both RY1 and RY2 are commonly closed approximately 8 seconds after turning ON the power, and pop noise of the voltage amplifier is muted by 100Ω and attenuation by RY1, the power amplifier's output impedance and the attenuation by RY2 by a total of approximately 100dB. When turning OFF the power, there is only a muting by 100Ω and RY1 (Approximately −80dB), but as the pop noise of the power supply of the voltage amplifier is very small when the power is turned OFF, there is no problem in practical use.

The upper and lower stages of the power amplifier are totally symmetrical, and as the input is grounded by RY1 at the time of power ON/OFF, there is no pop noise at all.



● Sequence of RY1 and RY2 at the time of DC detection

- Both RY1 and RY2 are commonly closed at the time of DC detection. If DC still appears at the speaker terminal in this condition, a current of the output voltage value divided by the contact resistance value of RY2 will flow, and the fuse (5A) on the primary side will melt.
- At the time of load short-circuit, RY1 and RY2 will not operate together, but due to the output level of the source equipment and the position of the attenuator of A-09, the signal level of the speaker terminal will become higher (when the load short-circuit current become higher) and the primary side fuse will melt.



6. ADJUSTMENTS

6.1 INITIAL ADJUSTMENT

6.1.1 Adjustment of DC Offset Voltage (Fig.1)

After having turned on the power, adjust VR301 and VR302 of VOLTAGE AMP assembly inside the rear box so that the voltage between the speaker terminals (+ and −) becomes within ±10mV.

6.1.2 Adjustment of the Idle Electric Current (Fig.2)

Adjust VR402 so that the voltage between the emitter resistors (R460, R466) of POWER R I/O assembly (between the idle check terminals) becomes 170mV.

Note : When on the left side, adjust VR401 of POWER L I/O assembly. Also reverse the polarity of the voltage meter.

6.2 AGING

After having adjusted the initialization, carry out aging for 5 minutes.

6.3 FINAL ADJUSTMENT

1. Adjust the DC offset voltage to within ±10mV with VR301 and VR302.
2. After this, carry out idle current adjustment of the voltage value with VR401 and VR402 to 150mV ±5mV.

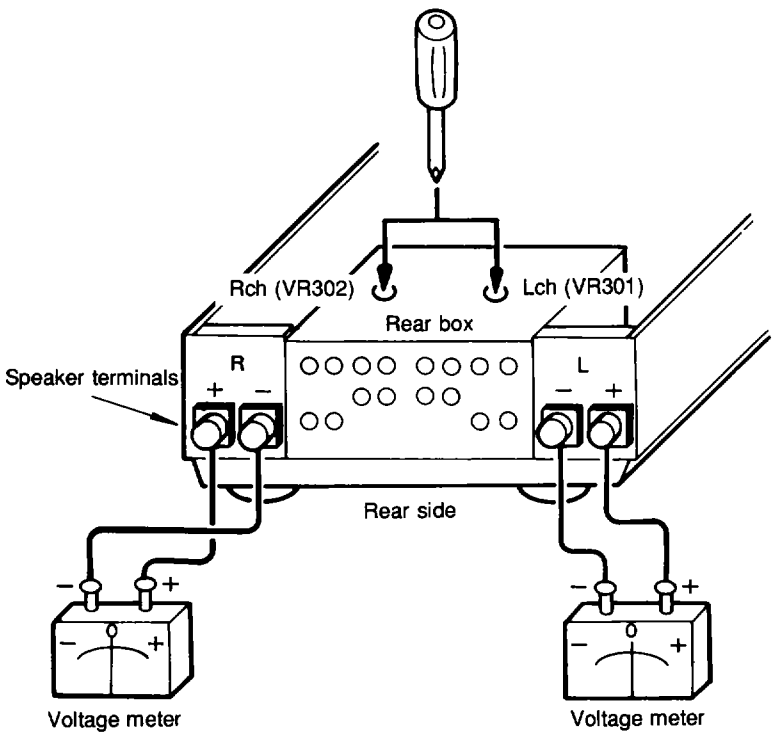


Fig. 1 DC offset voltage adjustment

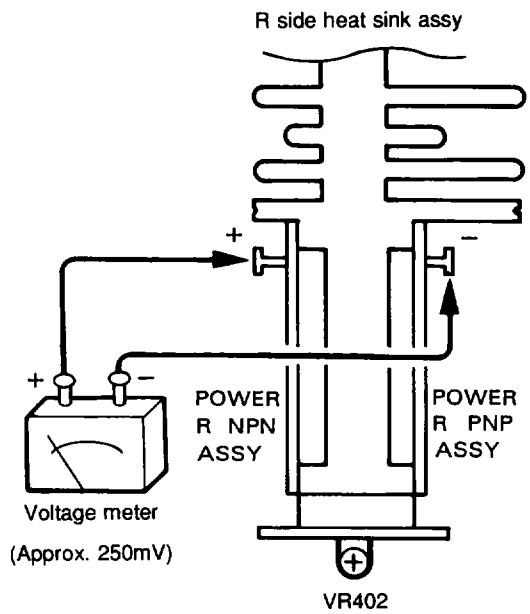
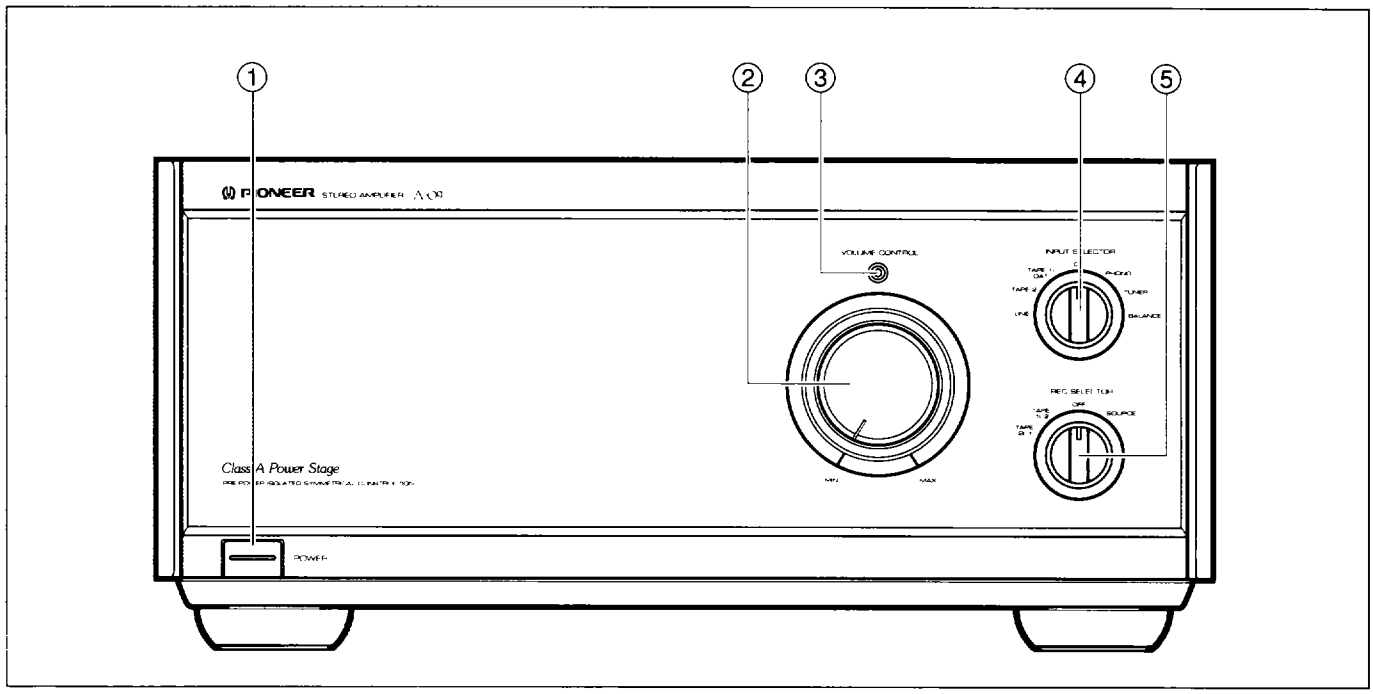


Fig. 2 Idle current adjustment

7. PANEL FACILITIES



FRONT PANEL

① POWER switch
Press to turn power to the unit ON and OFF.

② VOLUME CONTROL
This control is used to adjust the sound volume.

NOTE:
Since this control is an attenuator-type volume control, a clicking sound can be heard when adjusting the volume, in accordance with the signal level. This clicking sound is normal and not a malfunction.

③ VOLUME CONTROL indicator
This indicator flashes for about eight seconds whenever the power is first turned on. No sound is produced while the indicator is flashing.

④ INPUT SELECTOR
Use to select the playback source.

LINE: For playback with a component connected to LINE jacks.

TAPE 2: For playback with a cassette deck connected to TAPE 2 jacks.

TAPE 1/DAT: For playback with a cassette deck or digital audio cassette deck connected to TAPE 1/DAT jacks.

CD: For compact disc playback with a CD player.

PHONO: For record playback with a turntable.

TUNER: For AM or FM broadcast reception with a tuner.

BALANCE: For playback with a component connected to the BALANCE IN jacks.

⑤ REC SELECTOR (recording selector)
Use this control to switch between recording modes, including TAPE 2 ▷ 1, TAPE 1 ▷ 2, OFF, and SOURCE.

TAPE 2 ▷ 1: To record sounds from the TAPE 2 component to the component connected to the TAPE 1 / DAT jacks.

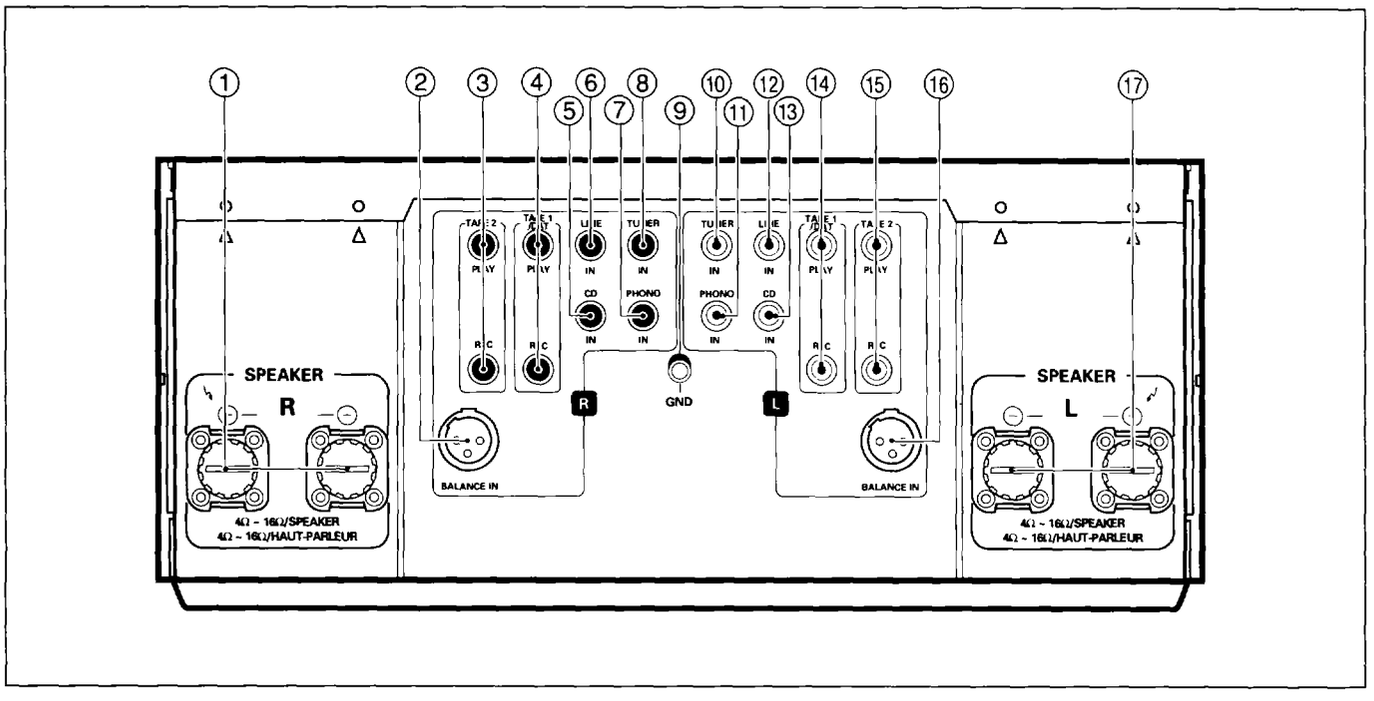
TAPE 1 ▷ 2: To record sounds from the TAPE 1/DAT component to the component connected to the TAPE 2 jacks.

OFF: Set here when not recording any source.

SOURCE: To record sounds from the source selected with the INPUT SELECTOR. In this case, the selected source sounds are output to both the TAPE 1/DAT and TAPE 2 recording (REC) jacks.

NOTE:
Sound is not output to the TAPE 1/DAT and TAPE 2 recording (REC) jacks in the following cases:

- *When the INPUT SELECTOR is set to TAPE 1/DAT, sound is not output to the TAPE 1/DAT jacks.*
- *When the INPUT SELECTOR is set to TAPE 2, sound is not output to the TAPE 2 jacks.*



REAR PANEL

① SPEAKER terminals (right)
② BALANCE IN jack (right)
③ TAPE 2 PLAY/REC jacks (right)
④ TAPE 1/DAT PLAY/REC jacks (right)
⑤ CD IN jack (right)
⑥ LINE IN jack (right)
⑦ PHONO IN jack (right)
⑧ TUNER IN jack (right)
⑨ Turn table ground terminal (GND)
⑩ TUNER IN jack (left)
⑪ PHONO IN jack (left)
⑫ LINE IN jack (left)
⑬ CD IN jack (left)
⑭ TAPE 1/DAT PLAY/REC jacks (left)
⑮ TAPE 2 PLAY/REC jacks (left)
⑯ BALANCE IN jack (left)
⑰ SPEAKER terminals (left)

8. SPECIFICATIONS

Amplifier Section

Continuous power output
(both channels driven at 20 Hz to 20 kHz)*
T.H.D 0.05%, 8 Ω ..... 35 W + 35 W
DIN Continuous power output (both channels driven at 1kHz)
T.H.D.1%, 8 Ω ..... 45 W + 45 W
T.H.D 1%, 4 Ω ..... 90 W + 90 W
Damping factor
(1 kHz/20 Hz to 20 kHz), 8 Ω 200/150
Total harmonic distortion*
20 Hz to 20 kHz, 35 W, 8 Ω 0.05%
20 Hz to 20 kHz, 70 W, 4 Ω 0.15%

- *Above specifications are for when power supply is 230 V.*

Input sensitivity/impedance
PHONO (MM) ..... 2.5 mV/50 kΩ
CD, TUNER, TAPE 1/DAT, TAPE 2, LINE ..... 150 mV/50 kΩ
BALANCE ..... 150 mV/600 Ω
PHONO overload level
1 kHz, T.H.D. 0.05% (MM) ..... 150 mV
Output level/impedance
TAPE REC output ..... 150 mV/1 kΩ
Frequency response
PHONO (MM) ..... 20 Hz to 20 kHz ± 0.2 dB
CD, TUNER, TAPE 1/DAT,
TAPE 2, LINE, BALANCE ..... 1 Hz to 150 kHz $^{+0}_{-3}$ dB
Signal-to-Noise ratio (IHF short circuit, A network)
PHONO (MM, 5 mV input) ..... 93 dB
CD, TUNER, TAPE 1/DAT,
TAPE 2, LINE, BALANCE ..... 109 dB
Signal-to-Noise ratio (DIN, continuous power/50 mW)
PHONO (MM) ..... 74 dB/69 dB
CD, TUNER, TAPE 1/DAT,
TAPE 2, LINE, BALANCE ..... 96 dB/74 dB

Power Supply/Miscellaneous

Power requirements ..... a.c. 220–230 Volts, 50/60 Hz
Power consumption ..... 400 W
Dimensions ..... 440 (W) x 480 (D) x 198 (H) mm
Weight (without package) ..... 28.8 kg

Accessories

Operating instructions 1
Cushion spacer set 1

NOTE:
Specifications and design subject to possible modification without notice, due to improvements.

* Measured by Audio Spectrum Analyzer.